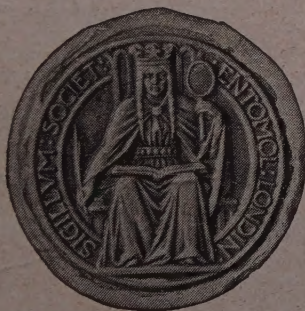


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OF  
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- 1918 MARCHAL, Dr. Paul, 45, *rue de Verrières, Antony, Seine, France.*
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- 1931 ‡ SILVESTRI, Prof. F., *R. Istituto Superiore Agraria, Portici, Naples, Italy.*
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- 1933 CUTHBERTSON, *Agricultural Laboratory, P.O. Box 387, Salisbury, S. Rhodesia.*
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- 1886-1922, 1934 :
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- 1897 ‡ TOMLIN, J. R. le B., M.A. (COUNCIL, 1911-13), 23, *Boscobel-road, St. Leonards-on-Sea.*
- 1907 ‡ TONGE, Alfred Ernest (COUNCIL, 1915-17, 1927-29), *Aincroft, Reigate, Surrey.*

- 1934 TONGYAI, M. R. Chakratong, *Dept. of Entomology, Cornell University, Ithaca, N.Y., U.S.A.*
- 1914 DE LA TORRE BUENO, J. R., 38, *De Kalb-avenue, White Plains, New York, U.S.A.*
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- 1895 ‡ TUNALEY, Henry, *Castleton, Searle-road, Farnham.*
- 1910 TURATI, Conte Emilio, 4, *Piazza S. Alessandro, Milano, Italy.*
- 1930 ‡ TURK, F. A., F.Z.S., *Tenter-Den, Roscroggan Hill, Tehidy, nr. Camborne, Cornwall.*
- 1898 ‡ TURNER, A. J., M.D., *Wickham-terrace, Brisbane, Australia.*
- 1893 ‡ TURNER, Henry Jerome, F.R.H.S. (V.-PRES., 1930; LIBRARIAN, 1921-9; COUNCIL, 1910-12, 1930), *Latemar, West Drive, Cheam, Surrey.*
- 1931 TWEEDIE, R. B., *Highwood Apiary, Chartridge, Chesham, Bucks.*
- 1923 ‡ TWIDLE, A., N.S.A., *The Rowans, Godstone Green, Surrey.*
- 1893 ‡ URICH, F. W., C.M.Z.S., 158, *Charlotte-street, Port of Spain, Trinidad, B.W.I.*
- 1920 ‡ UVAROV, B. P., *British Museum (Natural History), S. Kensington, S.W. 7.*
- 1933 VAJROPALA, K., 51, *Barkston-gardens, Earl's Court, S.W. 5.*
- 1922 ‡ VAN SOMEREN, V. G. L., C.M.Z.S., *Box 658, Nairobi, Kenya Colony.*
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- 1924 ‡ VAN STRAUBENZEE, Brig.-Gen. Casimir C. H., C.B., C.B.E., 18, *Basil-mansions, Basil-street, S.W. 3.*
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- 1933 WELTI, Mrs. I. M. T., *Roswyn*, 141, *Perry Vale*, *Forest Hill*, S.E. 23.
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- 1913 ‡ WHITLEY, P. N., *Brantwood*, *Halifax*; and *New College*, *Oxford*.
- 1913 ‡ WHITTAKER, Oscar, F.R.M.S., *Rivington*, *Teignmouth-road*, *Torquay*, *Devon*.
- 1911-1920, 1925:
- ‡ WHITTINGHAM, Rt. Rev. W. G., Lord Bishop of St. Edmundsbury and Ipswich, *The Bishop's House*, *Ipswich*.
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- 1922 ‡ WILKINSON, D. S., 8, *Manson-place*, S.W. 7.
- 1923 WILKINSON, Harold, *Dept. of Agriculture*, *Nairobi*, *Kenya Colony*.
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- 1915 ‡ WILLIAMS, H. B., LL.D., *Redmayes*, 79, *Broad-lane*, *Hampton*, *Middx*.
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- 1922 WILSON, F. E., *Cyathea*, *Ferncroft-avenue*, *E. Malvern*, *Victoria*, *Australia*.
- 1915 WINN, A. F., 32, *Springfield-avenue*, *Westmount*, *Montreal*, *Canada*.
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- 1926 ‡ WOMERSLEY, H., 36, *Wattle-street*, *Fullarton Estate*, *Adelaide*, *S. Australia*.
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- 1905 WOODBRIDGE, F. C., *Briar Close*, *Latchmore-avenue*, *Gerrards Cross S.O.*, *Bucks*.
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- 1921 WOOLETT, G. F. C., *Sipilang*, *Province Clarke*, *B.N. Borneo*.
- 1926 ‡ DE WORMS, C. G. M., M.A., Ph.D., A.I.C., *Milton Park*, *Egham*, *Surrey*.
- 1922 WRIGHT, A. E., *Brunleigh*, *Kent Bank-road*, *Grange-over-Sands*.
- 1927 ‡ WRIGHT, Rev. W. Rees, M.Sc., *The Rectory*, *Lochgilphead*, *Argyle*.

## ADDITIONS TO THE LIBRARY

DURING THE YEAR 1934.

- ABEILLE DE PERRIN (E.). Diagnoses de Chrysidés nouvelles. pp. 6. 8vo. Marseille, 1878.  
[Photostat copy.] *Société entomologique de France.*
- ADLERZ (G.). Svenska Fjärilar i urval, inledning till Fjärilarnas studium. pp. [ii] + 155, 54 pls.  
col. obl. 8vo. Stockholm, 1905. *Purchased.*
- ADLERZ (G.). Svenska Skalbaggar i urval, inledning till skalbaggarnes studium. pp. iv + 301,  
8 pls. col., text illust. 8vo. Stockholm, (1916). *Purchased.*
- AMERICAN ENTOMOLOGICAL SOCIETY. Banks (N.). Catalogue of the Neuropteroid insects  
(except Odonata) of the United States. pp. 53. 8vo. Philadelphia, 1907.  
*The Society.*
- ANTIGUA.—Colonial Development Fund.—Sugar-Cane Moth borer (*Diatraea*) Investigations.  
Outline of work done in Antigua during the year 1931. By H. E. Box. pp. 10.  
8vo. St. John's, Antigua, 1933.
- ANTIGUA.—Colonial Development Fund.—Sugar-Cane Moth borer (*Diatraea*) Investigations.  
Outline of work done in Antigua and St. Kitts during . . . 1932. Report upon  
the introduction and establishment of the Cuban parasite *Lixophaga diatraeae*  
Townsend. By H. E. Box. pp. [i] + 40, 1 pl. 8vo. [n. pl.] 1933.
- BADHAM (D.). The question concerning the sensibility, intelligence, and instinctive actions of  
insects. pp. [iv] + 54. 8vo. Paris, (1837). *Purchased. Carnegie Grant.*
- BARRAUD (P. J.). The fauna of British India, including Ceylon and Burma. Diptera. Vol. V.  
Family CULICIDAE: Tribes Megarhinini and Culicini. pp. xxviii + 463, 8 pls.,  
1 map, text illust. 8vo. London, 1934. *The Author.*
- BERGE (F.). Käferbuch. Allgemeine und specielle Naturgeschichte der Käfer, mit vorzüg-  
licher Rücksicht auf die europäischen Gattungen, etc. pp. 268, 36 pls. (col.),  
text illust. 8vo. Stuttgart, 1844. *Purchased.*
- BERLIN.—Universität.—Königlichen-zoologischen Museum. Preis-Verzeichniss vorrätiger  
Insectendoubletten des . . . Museums, &c. [By J. C. F. Klug.] pp. 18. 8vo.  
Berlin, 1829.  
[Reprint 1929]. *Dr. Walther Horn.*
- BOERNER (C.). Kleine Mitteilungen über Blattläuse. pp. 4. 4to. Naumberg (Saale), 1933.  
*The Author.*
- BOURNEMOUTH AND DISTRICT SOCIETY OF NATURAL SCIENCE [founded 1903]. A Natural History  
of Bournemouth and district . . . by the members of the . . . Society . . .  
edited by Sir Daniel Morris, etc. pp. xiv + 400, 19 pls., 3 maps (col.). 8vo.  
Bournemouth, 1914. *Mr. W. P. Curtis.*
- BRADLEY (J. C.). A laboratory guide to the study of the wings of insects. pp. [iii] + 41, 68 pls.,  
text illust. 8vo. Ithaca, N.Y., 1931. *Prof. P. A. Buxton.*
- BREHM (A. E.). Tierleben. Jubiläums-Ausgabe . . . von C. W. Neumann. Bd. 7. Die Insek-  
ten von E. Taschenberg. pp. [iii] + 544, 72 pls. (col.). 8vo. Leipzig, (1929).  
*Purchased.*
- BRITISH MUSEUM (Natural History). A catalogue of the works of Linnaeus and publications  
more immediately relating thereto . . . in the Libraries . . . of the . . .  
Museum. 2nd edition. pp. xi + 246 + 68, 7 pls. 4to. London, 1933.  
*The Trustees.*
- BRITISH MUSEUM (Natural History). Economic Series No. 4A. British mosquitoes and their  
control. By F. W. Edwards and S. P. James. pp. 30, text illust. 8vo. London,  
1934. *The Trustees.*
- BRITISH MUSEUM (Natural History). Economic Series No. 14. Clothes moths and house moths.  
Their life-history, habits and control. By E. E. Austen and A. W. McKenny  
Hughes. pp. 56, text illust. 8vo. London, 1932. *The Trustees.*
- BRITISH MUSEUM (Natural History).—Department of Entomology. The generic names of the  
Holarctic butterflies. Vol. I, 1758–1863. By F. Hemming. pp. viii + 184, 1934.  
*The Trustees.*



- CHENU ( ) *Dr.* Encyclopédie d'Histoire naturelle . . . d'après les travaux des naturalistes les plus éminents de tous les pays et de toutes les époques. . . . Papillons, avec la collaboration de H. Lucas. pp. [v] + 310, 40 pls., illust. 4to. Paris, [1851-1853.] *Purchased.*
- CHESHIRE (F. R.). Bees and bee-keeping: scientific and practical. A complete treatise on the anatomy, physiology, floral relations, and profitable management of the Hive Bee. Vol. I. Scientific. pp. viii + 336, 8 pls., text illust. Vol. II. Practical. pp. [iv] + 652, text illust. 8vo. London, 1888. *Mr. H. J. Turner.*
- CORBET (A. S.) and PENDLEBURY (H. M.). The Butterflies of the Malay Peninsula, including aids to identification, notes on their physiology and bionomics, and instructions for the collection and preservation of specimens under tropical conditions. pp. [ii] + xxiv + 252 + [xiv], 16 pls. (col.), 2 maps, text illust. 8vo. Kuala Lumpur, 1934. *Dr. M. Burr.*
- DAHLBOM (G.). Kort underättelse om skandinaviska insekters allmänna skada och nytta i hushållningen. En handbok för landtbrukare och naturforskare. pp. [ii] + vi + xxxvi + [ii] + 340 + [xii], 2 pls., 1 tab. 8vo. Lund, 1837. *Purchased.*
- DEJEAN (P. F. M. A.). Catalogue des Coléoptères de la collection de M. le Comte Dejean. pp. [ii] + 11. 8vo. Paris, 1802. *Dr. Walther Horn.*  
[Facsimile reprint, 1929.]
- DIDIER (R.). Études sur les Coléoptères Lucanides du Globe. Fasc. 1, 4. 8vo. Paris, 1928-29. *Purchased.*
- DOANE (R. W.). Insekter och Sjukdomar . . . af R. W. Doane öfversatt och bearbetad af I. Trägårdh. pp. viii + 152, 16 pls. 8vo. Stockholm, 1912. *Purchased.*
- DOBENECK (A. VON). Die Raupen der Tagfalter, Schwärmer und Spinner des mitteleuropäischen Faunen-Gebietes. Mit besonderer Berücksichtigung der Schädlinge und deren Bekämpfung. Als erster Beitrag für ein Bestimmungswerk der Insektenlarven analytisch bearbeitet. pp. xii + 260, text illust. 8vo. Stuttgart, 1899. *Purchased.*
- FOERSTER (A.). Hymenopterologische Studien. Part II. pp. 152. 4to. Aachen, 1856. *Purchased.*
- FRASER (F. C.). The fauna of British India, including Ceylon and Burma. Odonata. Vol. 2. pp. xxiii + 398, 4 pls. col., text illust. 8vo. London, 1934. *Sec. of State for India.*
- FROGGATT (W. W.). Forest insects and timber borers. pp. iv + 107, frontisp. col., illust. 8vo. Sydney, 1927. *Miss L. E. Cheesman.*
- G., (G. R.) [*i.e.* Gray, George Robert]. Notices of insects that are known to form the bases of fungoid parasites. pp. [i] + 22, 6 pls. 4to. [n. pl.] 1858. *Purchased.*  
Privately printed.
- GATER (B. A. R.). Aids to the identification of Anopheline larvae in Malaya. pp. 160, illust. 8vo. Singapore, 1934. *The Author.*
- GORSKI (S. B.). Analecta ad Entomographiam provinciarum occidentali-meridionalium Imperii Rossici. Fasc. I†. pp. xix + [i] + 214, 3 pls. col. 8vo. Berolini, 1852. *Purchased.*
- GREAT BRITAIN AND NORTHERN IRELAND.—Colonial Office.—Entomological Research Committee (Tropical Africa). Instructions to Collectors. pp. 20, 4 pls. 8vo. (London), 1909. Misc. no. 241.
- GREAT BRITAIN AND NORTHERN IRELAND.—Board of Education.—Science Library. Hand-list of short-titles of current periodicals in the Science Library (— supplement). 4th edition, edited by S. C. Bradford. pp. 176 + 164. 8vo. London, 1926-29. *Presented.*
- GREAT BRITAIN AND NORTHERN IRELAND.—Economic Advisory Council.—Committee on Locust Control. The Locust outbreak in Africa and Western Asia in 1932 . . . by B. P. Uvarov. pp. 74, 11 maps. 8vo. London, 1933.
- GREAT BRITAIN AND NORTHERN IRELAND.—House of Commons. Pétition of Mr. Henry Phillips [relating to insect pests in West Indies]. pp. 4. fol. (London), 1780. *Mr. H. E. Box.*
- GRILL (C.). Catalogus coleopterorum Scandinaviae, Daniae, et Fenniae. Adjectis synonymis gravioribus, observationibus et indicata singulorum distributione geographica. (Förteckning öfver Skandinaviens, Danmarks och Finlands Coleoptera, &c.) pp. vii + 426 + [i]. 8vo. Holmiae, 1896. *Purchased.*  
Interleaved and annotated.
- HEWLETT (E.) (afterwards Copley). Scripture natural history for youth. 2 vols. pp. 668, 82 pls. sm. 8vo. London, 1828. *Purchased.*

- HINE (R. L.). *Editor*. The Natural History of the Hitchin region. Edited by R. L. Hine, &c. Contributors E. F. D. Bloom, Miss G. B. Howells, J. E. Little, R. Palmer, A. H. Foster, F. W. Edwards, and W. H. Lane. pp. 256; 30 pls. (col.); 1 map. 8vo. Hitchin, 1934. *Mr. R. L. Hine.*
- HINGSTON (R. W. G.). Darwin. pp. 144. sm. 8vo. London, (1934). *Prof. G. D. Hale Carpenter.*  
(Great Lives, No. 27).
- HOFFMANN (J.). Der Schmetterlingsammler. Beschreibung und Abbildung der vorzüglichsten in Mitteleuropa heimischen Schmetterlinge, etc. pp. iv + 158, 19 pls. col. 16mo. Stuttgart, 1877. *Purchased.*
- HUEBNER (J.). Erste Zuträge zur Sammlung exotischer Schmetterlinge, bestehend in genauer und richtiger Bekundigung einzeln erworbener Bildermuster neuerfundener americanischer und columbianischer Schmetterlingsgattungen, &c. pp. 8. 8vo. Augsburg, 1808. *Mr. H. J. Turner.*  
[Photostat copy.]
- JMMS (A. D.). A general textbook of Entomology, etc. Third edition, revised and enlarged. pp. xii + 727, text illust. 4to. London, 1934. *The Publishers.*
- INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE. Opinions rendered by the . . . Commission, etc. Nos. 1-29, 38-51. 8vo. Washington, D.C., 1910-12. *Mr. Cowley.*
- JANET (C.). Études sur les Fourmis, les Guêpes et les Abeilles. Note 14. Rapports des animaux myrmécophiles avec les Fourmis. pp. 98 + [i]. 8vo. Limoges, 1897.
- JANSE (A. J. T.). The moths of South Africa. Vol. II, pts. 1-2. GEOMETRIDÆ (concl'd.). pp. 192, text illust. 8vo. Durban, 1933. *Purchased.*
- KLUK (J.). Zwierz Hist. nat. pocz. gospod. [The Natural History of Poland.] 8vo. [n. pl.] 1802. *Purchased.*  
Photostat copy of pp. 78-111, Lepidoptera.
- KOFOID (C. A.). *Editor*. Termites and Termite control. [By] C. A. Kofoid, editor in chief, S. F. Light, A. C. Horner, M. Randall, W. B. Herms, and E. E. Bowe. pp. [v] + xxv + 734, illust., 82 tab. 8vo. Berkeley, 1934. *Dr. M. Burr.*
- KRAUSSE (A. H.). Die antennalen Sinnesorgane der Ameisen, &c. Inaugural-dissertation. pp. 40, text illust. 8vo. Jena, 1907.
- KUEHN (A. C.). Kurze Anleitung Insecten zu sammeln. pp. [viii] + 182. sm. 8vo. Eisenach, 1783. *Dr. L. G. Higgins.*
- KUPER (C. A. F.). [Entomological Calendar, 1820-1875.] 2 vols. MSS. Pp. 573. 8vo. [n. pl.] 1820-75. *Purchased.*
- KUPER (C. A. F.). [Entomological Catalogue of his collection of Coleoptera.] 4 vols. MSS. Pp. 1378 + [20]. 8vo. [n. pl.] 1834, 1838, 1843. *Purchased.*  
20 unnumbered pages are inserted in Vol. 2.
- LENG (C. W.). Catalogue of the Coleoptera of America, North of Mexico. (— Supplement 1919 to 1924 inclusive. — second and third supplements 1925 to 1932 inclusive.) pp. xi + 470 + 78 + [vi] + 112, 1 chart. 4to. New York, 1920-1933. *Purchased.*  
The supplements are by C. Leng and A. J. Mutchler.
- MILNE (L. J.). Studies in North American Trichoptera. I. pp. 19. 8vo. Cambridge, Mass., 1934. *Purchased.*
- MUELLER (C. L. VON). Entomologisches Taschenbuch für Schmetterlings-Sammler. pp. 132, 1 pl. col. sm. 8vo. Breslau, 1800. *Purchased.*
- MUSGRAVE (A.). Bibliography of Australian Entomology 1775-1930 with biographical notes on authors and collectors. pp. viii + 380. 8vo. Sydney, 1932. *The Author.*  
Published by the "Royal Zoological Society of New South Wales."
- NIEPALT (W.). Kleine Mitteilungen. *Agrias phoenix* Niep. und *A. croesus* Staudgr., *A. semirubra* Niep. pp. IV. 8vo. [n. pl., n.d.] *Joicey Library.*
- OLIVIER (G. A.) [1756-1814]. Olivier's Entomologie . . . Käfer. Uebersetzt und mit Zusätzen und Anmerkungen durchgängig begleitet von K. Illiger. 2 Thl. 4to. Braunschweig, 1800-02. *Purchased.*  
This is equivalent to Vol. 1 only of the original, although no plates were issued with this translation.  
A set of plates was published under the title "Abbildungen zu K. Illiger's 'Uebersetzung von Olivier's Entomologie,'" &c. by J. Sturm [q.v.]. *Mr. T. Bainbrigge Fletcher.*
- ORBIGNY (H. d'). Voyage de M. Guy Babault dans l'Afrique orientale anglaise. Résultats scientifiques: insectes coléoptères. SCARABEIDÆ. Onthophagini et Oniticellini. pp. 32, 3 pls. col., text illust. 4to. Paris, 1916. *Purchased.*



- PANIS (G.). Catalogue méthodique, synonymique et alphabétique des Papillons de France, et manuel de Lépidopteriste. . . etc. pp. 320, 4 pls. 8vo. Paris, (1894?).  
*Purchased.*
- PANZER (G. W. F.). Faunae Insectorum Germanicae initia oder Deutschlands Insecten. Heft 191. (Unpublished.)
- PAOLI (G.). Prodrómo di entomologia agraria della Somalia italiana, etc. pp. 427, text illust. 8vo. Firenze, 1931-33.  
*Biblioteca Agraria coloniale.*  
*The Author.*
- PONTOPIDAN (E. L.). Den danske Atlas eller Konge-Riget Danemark, etc. Tom. 1. pp. [viii] + xl + [iv] + 724, 30 pls. 8vo. Kiøbenhavn, 1763.  
*Purchased.*
- RENSCH (B.). Kurze anweisung für zoologisch-systematische Studien. pp. [iv] + 116, text illust. 8vo. Leipzig, 1934.  
*The Publishers.*
- ROBINEAU-DESVOIDY (J. B. [1799-1857]). Histoire naturelle des Diptères des environs de Paris. Oeuvre posthume . . . publiée . . . sous la direction de H. Monceaux. 2 tom. 8vo. Paris, 1863.  
*Purchased.*
- ROTHSCHILD (W.) Lord, and DURRANT (J. H.). Lepidoptera of the British Ornithologists' Union and Wollaston expeditions in the Snow Mountains, Southern Dutch New Guinea. pp. 182 + [ii]; 2 pls. col. 4to. Tring, 1915.  
*Lord Rothschild.*
- ROYAL ENTOMOLOGICAL SOCIETY OF LONDON.—Committee on Generic Nomenclature. [1934-]. The generic names of British Insects prepared by the Committee . . . with the assistance of the Department of Entomology of the British Museum (Natural History).  
Part 1. Recommendations relating to the publication of the Committee's reports. pp. 6. 1934.  
Part 2. The generic names of the British Rhopalocera with a check list of the species. (By A. F. Hemming.) pp. 9-40. 1934.
- SCHAEFFER (J. C.). Neuentdeckte Theile an Raupen und Zweyfaltern nebst der Verwandlung der Hauswurzraupe zum schönen Tagvogel mit rothen Augenspiegeln. pp. [vi] + 54, 2 pls. col. 8vo. Regensburg, 1754.  
*Mr. H. J. Turner.*
- SCHNACK (F.). Das kleine Schmetterlingsbuch, kolorierte Stiche von Jacob Hübner. Geleitet von Friedrich Schnack. Die Tagfalter. pp. 47, illust. col. 8vo. Leipzig, [1934].
- SCHOENICHEN (W.). Praktikum der Insektenkunde nach Biologisch-ökologischen Gesichtspunkten. pp. vii + 193, text illust. 4to. Jena, 1918.  
*Purchased.*
- STURM (J.) [1771-1848]. Abbildungen zu K. Illiger's Uebersetzung von Olivier's Entomologie . . . Kafer. [With descriptive text.] 2 Thl. 4to. Nurnberg, [1801-]1802-03.  
[Pp. 45-48 are omitted in the pagination to Theil 1.]  
This copy was purchased at the sale of J. G. Children's Library, it having originated in the Library of A. H. Haworth who added in pencil the name of each insect.  
*Mr. T. Bainbrigg Fletcher.*
- TIME'S TELESCOPE. Time's Telescope for 1820, or a complete guide to the Almanack; containing . . . the Naturalist's diary, explaining the various appearances in the animal . . . kingdoms, to which is prefixed an introduction containing the Outlines of Entomology. pp. lxviii + 323, frontisp. 8vo. London, 1820.  
*Purchased.*
- TULLGREN (A.) and WAHLGREN (E.). Svenska Insekter: en orienterande handbok vid studiet av vårt lands insektfauna. 3 Heft. pp. vii + 812, 9 pls. col., text illust. 4to. Stockholm, 1920-22.  
*Purchased.*
- W. (Mrs.), and M. (Lady). Entomology in sport, and entomology in earnest. pp. 68, illust. col. 8vo. London. [n.d.]  
*Mr. J. Cowley.*
- WALKER (F. A.). Oriental Entomology. 2 Parts. pp. 24 + 35. 8vo. London, [1887?].  
[Read at the Victoria Institute or Philosophical Society of Great Britain].
- ZWANZIGER (I.). Handbuch der Schmetterlings-Kunde. Der vaterländischen Jugend geweiht, &c. pp. xvi + 233, 7 pls. col. 16mo. Wien, [1844].  
*Purchased.*

## NEW JOURNALS AND PERIODICALS.

- Annuaire Entomologique, par A. Fauvel. 8vo. Caen and Paris, 1879-80.
- Annual Report and Reports of the Recorders. Lancashire and Cheshire Fauna Committee. Nos. 13, 15-19. 8vo. (Manchester) Darwen, 1926, 1928-32.  
*Mr. H. Britten.*
- Arbeiten über morphologische und taxonomische Entomologie aus Berlin-Dahlem. Bd. 1→. 8vo. Berlin, 1934→.

- Arbeiten über physiologische und angewandte Entomologie aus Berlin-Dahlem. Bd. 1→. 8vo. Berlin, 1934→.
- Casopis. Acta Societatis entomologicae Bohemiae. Roč. 1→. 8vo. Prag, 1904→.
- Entomologische Beihefte aus Berlin-Dahlem. Bd. 1→. 8vo. Berlin, 1934→.
- Entomologista Brasileiro. Anno 1, nos. 6-7†. 8vo. S. Paulo, 1908.
- Fukuoka Entomological Society. Mushi. Vol. 3→. 8vo. Fukuoka, 1930→.
- Genera Insectorum de P. Wytzman.
- Fasc. 192<sup>a</sup>. Coleoptera Adephaga. CARABINAE IV, by G. Vacher de Lapouge. 1932.
- " 194. Diptera. CULICIDAE, by F. W. Edwards. 1932.
- " 195. Coleoptera Lamellicornia. SCARAB. EUCHIRINAE-PHAENOMERINAE, by F. Ohaus. 1933.
- " 196. MANTIDAE HYMENOPODINAE, by M. Beier. 1934.
- " 197. " SIBYLLINAE and EMPUSINAE, by M. Beier. 1934.
- " 198. " TOXODERINAE, by M. Beier. 1934.
- " 199<sup>a</sup>. Coleoptera Lamellicornia. RUTELINAE, by F. Ohaus. 1934.
- Insect World, The. A monthly magazine devoted to the useful application and scientific study of Entomology edited by Y. Nawa, &c. illust. vol. 3, pt. 5; 23→. 8vo. Gifu, 1899, 1919→.
- Koleopterologische Rundschau. Bd. 20→. 8vo. Wien, 1934→.
- Mémoires de la Société Royale des Sciences de Liege. Ser. 3, vol. 18→. 4to. Brussels, 1933→.
- Notes d'entomologie Chinoise. Fasc. 1→. 8vo. Changhai, 1929→.
- Revista española de Biología. Vol. 1→. 8vo. Madrid. 1932→.
- Revue française d'Entomologie. 1→. 4to. Paris, 1934→.
- Verhandlungen des Vereins für Naturwissenschaftliche Unterhaltung zu Hamburg. Bd. 1→. 8vo. Hamburg, 1875→.
- Ward's Entomological Bulletin. Vol. 2→. 4to. Rochester, N.Y., 1933→.

#### SEPARATES FROM PUBLICATIONS AND JOURNALS NOT RECEIVED IN THE LIBRARY.

- ADAMSON (C. H. E.). Catalogue of butterflies collected in Burma up to the end of 1895, etc. 2 Parts.  
Trans. nat. Hist. Soc. Northumb. Durh. Newc., 1: 155-189, 1905.  
————— (n.s.) 3: 116-148, 1908.  
*Purchased. Joicey Library.*
- ADKIN (R.). The Butterflies and Moths of Eastbourne. 1st Supplement. Additions and corrections.  
Trans. Eastbourne nat. Hist. Soc., 10 (Suppl.): 1-13, 1934. *The Author.*
- ALEXANDER (C. P.). Diptera collected on Southampton Island by George Miksch Sutton. TRICHO CERIDAE and TIPULIDAE.  
Mem. Carnegie Mus., 12: 3-10, 1 pl., 1934. *Imp. Institute of Entomology.*
- AMSEL (H. G.). Die Lepidopteren Palästinas. Eine zoogeographisch-ökologisch-faunistische Studie.  
Zoogeographica, 2: 1-146. 1933. *The Author.*
- ANDREWES (H. E.). CARABIDAE from Seistan.  
Rec. Ind. Mus., 18: 99-101, 1919.
- ANDREWES (H. E.). The fauna of an island in the Chilka Lake. The CARABIDAE of Barkuda Island.  
Rec. Ind. Mus., 22: 339-348, 1921. *The Author.*
- ANDREWES (H. E.). Coleoptera of Siju Cave, Garo Hills, Assam. CARABIDAE.  
Rec. Ind. Mus., 26: 115-117, 1924. *The Author.*
- ANDREWES (H. E.). A catalogue of Philippine CARABIDAE.  
Philipp. J. Sci., 31: 345-361, 1926. *The Author.*
- ANDREWES (H. E.). On some new species of CARABIDAE from Sumatra contained in the collection of the Leyden Museum.  
Zool. Meded., 13: 193-203, 1930. *The Author.*
- ANDREWES (H. E.). Some keys to Sumatran CARABIDAE, together with descriptions of further new species.  
Zool. Meded., 14: 54-78, 1931. *The Author.*
- ANDREWES (H. E.). Coleoptera. CARABIDAE of the Juan-Fernandez Islands.  
Skottsberg (C.). The Natural History of Juan Fernandez and Easter Island, 3: 629-637, text illust., 1931. *The Author.*



- ANDREWES (H. E.). Résultats scientifiques du voyage aux Indes orientales néerlandaises de . . . Prince . . . Léopold de Belgique. Vol. 4, fasc. 4. CARABIDAE. pp. 7-14, text illust., 1932.  
Mém. Mus. Hist. nat. Belg. (hors série). *The Author.*
- ANDREWES (H. E.). Oriental CARABIDAE [Coleoptera] collected by . . . Prince Leopold of Belgium in 1932.  
Bull. Mus. Hist. nat. Belg., **9**, no. 25 : 1-2, 1933. *The Author.*
- ANNANDALE (N.). Notes on the fauna of a desert tract in Southern India. Part II. Insects and Arachnida.  
Mem. Asiat. Soc. Beng., **1** : 203-219, 1 pl., 1906.
- AVINOFF (A.). Descriptions of some new species and varieties of Rhopalocera in the Carnegie Museum.  
Ann. Carnegie Mus., **16** : 355-374, 4 pls., 1926. *Purchased. Joicey Library.*
- BAKER (C. F.). Some Philippine and Malaysian MACHAEROTIDAE (Cercopioidea).  
Philipp. J. Sci., **32** : 529-547, 4 pls., 1927.
- BANG-HAAS (A.). Lepidoptera Groenlandica.  
Vidensk. Medd. naturh. Foren. Kjøb., **1896** : 178-195, 1896.  
*Purchased. Joicey Library.*
- BARBER (M. E.). On the peculiar colours of animals in relation to habits of life.  
Trans. Phil. Soc., **1878** : 27-45, 1878. *Purchased. Joicey Library.*
- BARNARD (K. H.). The Colophon.  
J. Mount. Cl. S. Afr., **34** : 19-22, 1 pl., 1931. *The Author.*
- BARNES (H. F.). A cambium miner of basket willows (AGROMYZIDAE) and its inquiline gall midge (CECIDOMYIDAE).  
Ann. appl. Biol., **20** : 498-519, 2 pls., text illust., 1933. *Rothamsted Exp. Station.*
- BASILEWSKI (P. de). Les Carabidés de Belgique.  
Bull. mens. Nat. belges, **2** : 32-34; 39-52, text illust., 1931.
- BÉGUET (M.). Tableau synoptique de détermination des stades évolutifs de la *Schistocerca peregrina* Ol.  
Bull. Soc. Hist. nat. Afr. N., **10** : 128-129, text illust., 1919. *Prof. Buxton.*
- BEMIS (F. E.). The Aleyrodids, or mealy-winged flies, of California, with references to other American species.  
Proc. U.S. Nat. Mus., **27** : 471-537, 11 pls., 1904.
- BÉNARD (G.). Coléoptères Aphodiines : genre *Rhyssemus*.  
Voyage de . . . M. de Rothschild en Ethiopie et en Afrique orientale anglaise (1904-1905). pp. 635-638, 1 pl. col., text illust. 4to. Paris, 1922.
- BENGTTSSON (S.). Studier öfver Insektlarver. I. Till Kännedomen om larven af *Phalacroceras replicata* (Lin.).  
Acta Univ. Lund, **33** : 1-102, 4 pls., 1897. *Purchased.*
- BENGTTSSON (S.). Zur Morphologie des Insektenkopfes.  
Zool. Anz., **29** : 457-476, text illust., 1905. *The Author.*
- BENGTTSSON (S.). Beiträge zur Kenntnis der paläarktischen Ephemeren.  
Acta Univ. Lund (n.f.) Afd. 2. **5** (K. Fysiogr. Sällskap. Handl. (n.f.) **20**). pp. 1-19, 1909. *The Author.*
- BENGTTSSON (S.). Braconologische Beiträge I-II.  
Acta Univ. Lund (n.f.) Afd. 2, **14** Nr. 32 (K. Fysiogr. Sällskap. Handl. (n.f.) **29** Nr. 32). pp. 1-47, text illust., 1918. *The Author.*
- BENGTTSSON (S.). De i Linnés Skånska resa omnämnda insekterna i kritisk belysning.  
Svenska Linnésällsk. Årsskr., **3** : 81-102, 1920. *The Author.*
- BENGTTSSON (S.). Dielarven der nordischen Arten von *Carabus* Lin. Eine morphologische studie.  
Acta Univ. Lund (n.f.) Afd. 2. **24** Nr. 2 (K. Fysiogr. Sällskap. Handl. (n.f.) **39** Nr. 2). pp. 1-88, text illust., 1927. *The Author.*
- BENGTTSSON (S.). Les Plécoptères de la Suède.  
Ann. Biol. lacust., **13** : 219-220, (1924) 1925. *The Author.*
- BENGTTSSON (S.). La nutrition des larves des Ephémères.  
Ann. Biol. lacust., **13** : 215-217, (1924) 1925. *The Author.*
- BENGTTSSON (S.). Beitrag zur Kenntnis der Ephemeropteren des nördlichen Norwegen.  
Tromsø Mus. Aarsh., **51**, no. 2 : 1-19, text illust., (1928) 1930. *The Author.*
- BENGTTSSON (S.). Kritische Bemerkungen über einige nordische Ephemeropteren, nebst Beschreibung neuer larven.  
Acta Univ. Lund (n.f.) Afd. 2, **26** Nr. 3 (K. Fysiogr. Sällskap. Handl. (n.f.) **41** Nr. 3). pp. 1-27, text illust., 1930. *The Author.*

- BENGTSOON (S.). Plecopterologische studien. Ein Beitrag zur Kenntnis der Plecopteren Schwedens.  
Acta Univ. Lund (n.f.) Avd. 2, 29 Nr. 5 (K. Fysiogr. Sällskap. Handl. (n.f.), 44, Nr. 5).  
pp. 1-50, text illust., 1933. *The Author.*
- BERLAND (L.) and others. Contribution à l'étude du peuplement zoologique et botanique des Iles du Pacifique, par L. Berland, L. G. Seurat, L. Chopard, Miss E. Cheesman, K. Holdhaus, E. P. Mumford, A. M. Adamson, C. Skottsberg, E. H. Bryan, Jr., and others.  
Mém. Soc. Biogéogr., 4 : 1-288, 3 pls., text illust., 1934.
- BERTONI (A. de W.). Sobre Coleopteros que merecen su considerados plagas de la agricultura.  
Rev. Soc. cient. Paraguay, 1 : 92-93, 1924. *Purchased. Joicey Library.*
- BEUTENMUELLER (W.). Description of a new moth from North Carolina. [*Olene montana* sp. nov.]  
Bull. Amer. Mus. nat. Hist., 19 : 585-586, 1903. *Purchased. Joicey Library.*
- BEUTENMUELLER (W.). Types of Diptera in the collection of the American Museum of Natural History.  
Bull. Amer. Mus. nat. Hist., 20 : 87-99, 1904.
- BEUTENMUELLER (W.). The types of CYNIPIDAE in the collection of the American Museum of Natural History.  
Bull. Amer. Mus. nat. Hist., 20 : 23-28, 1904. *Purchased. Joicey Library.*
- BEUTENMUELLER (W.). Notes on a few north American CYNIPIDAE, with descriptions of new species.  
Bull. Amer. Mus. nat. Hist., 23 : 463-466, 1 pl., 1907. *Purchased. Joicey Library.*
- BEUTENMUELLER (W.). The north American species of *Rhodites* and their galls.  
Bull. Amer. Mus. nat. Hist., 23 : 629-651, 5 pls., 1907. *Purchased. Joicey Library.*
- BEUTENMUELLER (W.). Notes on and descriptions of new forms of *Catocala*.  
Bull. Amer. Mus. nat. Hist., 23 : 145-151, 1907. *Purchased. Joicey Library.*
- BEUTENMUELLER (W.). New species of gall-producing CECIDOMYIIDAE.  
Bull. Amer. Mus. nat. Hist., 23 : 385-400, 5 pls., 1907. *Purchased. Joicey Library.*
- BEUTENMUELLER (W.). New forms of *Catocala*.  
Bull. Amer. Mus. nat. Hist., 23 : 935-940, 1907. *Purchased. Joicey Library.*
- BEUTENMUELLER (W.). Some north American CYNIPIDAE and their galls.  
Bull. Amer. Mus. nat. Hist., 26 : 277-281, 1 pl., 1909. *Purchased. Joicey Library.*
- BEUTENMUELLER (W.). The species of *Biorhiza*, *Philonix* and allied genera, and their galls.  
Bull. Amer. Mus. nat. Hist., 26 : 243-256, 3 pls., 1909. *Purchased. Joicey Library.*
- BEUTENMUELLER (W.). The north American species of *Diastrophus* and their galls.  
Bull. Amer. Mus. nat. Hist., 26 : 135-145, 4 pls., 1909. *Purchased. Joicey Library.*
- BEUTENMUELLER (W.). The species of *Holcaspis* and their galls.  
Bull. Amer. Mus. nat. Hist., 26 : 29-45, 3 pls., 1909. *Purchased. Joicey Library.*
- BEUTENMUELLER (W.). The species of *Amphibolips* and their galls.  
Bull. Amer. Mus. nat. Hist., 26 : 47-66, 6 pls., 1909. *Purchased. Joicey Library.*
- BEUTENMUELLER (W.). The north American species of *Neuroterus* and their galls.  
Bull. Amer. Mus. nat. Hist., 28 : 117-136, 6 pls., 1910. *Purchased. Joicey Library.*
- BEUTENMUELLER (W.). The north American species of *Aylax* and their galls.  
Bull. Amer. Mus. nat. Hist., 28 : 137-144, 1 pl., 1910. *Purchased. Joicey Library.*
- BEUTENMUELLER (W.). The north American species of *Aulacidea* and their galls.  
Bull. Amer. Mus. nat. Hist., 28 : 253-258, 3 pls., 1910. *Purchased. Joicey Library.*
- BEUTENMUELLER (W.). The north American species of *Dryophanta* and their galls.  
Bull. Amer. Mus. nat. Hist., 30 : 343-369, 6 pls., 1911. *Purchased. Joicey Library.*
- BLAIR (K. G.). Coleoptera of the Siju Cave, Garo Hills, Assam. HISTERIDAE, HYDROPHILIDAE, EROTYLIDAE, LATHRIDIDAE, TENEBRIONIDAE, and HYLOPHILIDAE.  
Rec. Ind. Mus., 26 : 120-122, 1924.
- BLAKE (D. H.). Revision of the beetles of the genus *Disonycha* occurring in America North of Mexico.  
Proc. U.S. nat. Mus., 82 Art. 28 : 1-66, 8 pls., 1933. *U.S. Dept. of Agriculture.*
- BODENHEIMER (F. S.). Zur Frühgeschichte der Erforschung des Insektenparasitismus.  
Arch. Gesch. Naturw. Tech., 13 : 402-416, 1931. *Prof. Buxton.*
- BODENHEIMER (F. S.) and GUTTFIELD (M.). Über die Möglichkeiten einer biologischen Bekämpfung von *Pseudococcus citri* Risso (Rhy. COCC.) in Palästina. (Eine epidemiologische Studie.  
Z. angew. Ent., 15 : 67-136, text illust., 17 tab., 1929. *Prof. Buxton.*



- BOERNER (C.). Aphidoidea, Blattläuse [of Germany].  
Brohmer, P. Fauna von Deutschland, 4 : 197-208, illust., 1932. *The Author.*
- BOERNER (C.). Lepidoptera. Schmetterlinge [of Germany].  
Brohmer, P. Fauna von Deutschland, 4 : 369-404, text illust., 1932. *The Author.*
- BOULET (E.) and LECERF (F.). Descriptions de formes nouvelles d'Héliconides [Lepidoptères Rhopalocères] de la collection du Muséum. 2 Notes.  
Bull. Mus. Hist. nat. Paris, 1909 : 459-463, 1909.  
1910 : 24-26, 1 pl., 1910. *Purchased. Joicey Library.*
- BOUVIER (E.-L.). Quelques Saturniens nouveaux de l'Amérique tropicale.  
Bull. Mus. Hist. nat. Paris, 1923 : 422-427, text illust., 1923.  
*Purchased. Joicey Library.*
- BOUVIER (E.-L.). Observations sur quelques Saturniens recueillis au Venezuela, par M. Grisol.  
Bull. Mus. Hist. nat. Paris, 1923 : 353-359, illust., 1923.  
*Purchased. Joicey Library.*
- BOUVIER (E.-L.). Sur les *Adelocephala*, *Anisota* et *Syssphinx* des collections du Muséum.  
C.R. Socs. sav. Paris Déps., 1923 : 57-64, 1923. *Purchased. Joicey Library.*
- BOUVIER (E.-L.). *Ormiscosdes gregatus*, Saturnien dont les chenilles édifient en société des bourses complexes.  
C.R. Acad. Sci. Paris, 1923 : 1081-1085, 1923. *Purchased. Joicey Library.*
- BOUVIER (E.-L.). Les Saturniens hémileucides du genre chilien *Catocephala* Blanchard.  
C.R. Socs. sav. Paris Déps., 1924 : 269-274, 1924. *Purchased. Joicey Library.*
- BOUVIER (E.-L.). Contribution à l'étude des Saturniens.  
Ann. Sci. nat. Zool., (10) 7 : 137-178, text illust., 1924.  
*Purchased. Joicey Library.*
- BOUVIER (E.-L.). Sur les Saturniens du groupe des *Arsenura* d'après les matériaux de la collection du Muséum.  
Bull. Mus. Hist. nat. Paris, 1924 : 75-80, 1924. *Purchased. Joicey Library.*
- BOUVIER (E.-L.). Sur la variabilité et les formes des "*Bunaea*" normaux, papillons hétéroocères de la famille des Saturnides.  
Ann. Sci. nat. Zool., (10) 9 : 307-337, 1 pl., 1926. *Purchased. Joicey Library.*
- BOUVIER (E.-L.). Étude sur les Cératocampidés de la collection Charles Oberthür.  
Ann. Sci. nat. Zool., (10) 10 : 233-288, 3 pls., text illust., 1927.  
*Purchased. Joicey Library.*
- BOUVIER (E.-L.). Saturniens du Musée du Congo Belge.  
Rev. zool. afr., 15 : 129-171, text illust., 1927. *Purchased. Joicey Library.*
- BOUVIER (E.-L.). Observations sur la structure et le classement des Saturniens d'Afrique.  
Mém. Acad. Sci. Paris, 59, No. 4 : 1-42, text illust., 1928.  
*Purchased. Joicey Library.*
- BOUVIER (E.-L.) and BRÈTHES (J.). Sur les "*Heliconisa*" et leurs différences sexuelles.  
Rev. Univ. B. Aires (2) Sec. 5, 1 : 37-41, text illust., 1924.  
*Purchased. Joicey Library.*
- BROWN (C. J. D.). A preliminary list of Utah Odonata.  
Occ. Pap. Mus. Zool. Univ. Mich., 291 : 1-17, 1 map, 1934.
- BROWN (F. M.). A revision of the genus *Phoebis* (Lepidoptera).  
Amer. Mus. Nov., 368 : 1-22, text illust., 1929. *Purchased. Joicey Library.*
- BROWN (F. M.). A revision of the genus *Aphrissa*.  
Amer. Mus. Nov., 454 : 1-14, text illust., 1931. *Purchased. Joicey Library.*
- BRUG (S. L.). *Anopheles incognitus*, n. sp.  
Geneesk. Tijdschr. Ned.-Ind., 2 : 136-137, 1931. *Prof. Buxton.*
- BRULLÉ (A.). Coup d'œil sur l'Entomologie de la Morée.  
Ann. Sci. nat., 23 : 244-267, 1831. *Mr. Champion.*
- BRYAN (E. H.), jr. The contributions of Bishop Museum to polynesian biogeography.  
Mém. Soc. Biogéogr., 4 : 281-288, 2 tab., 1934.
- BRYAN (E. H.), jr. and others. Insects of Hawaii, Johnston Island and Wake Island.  
Tanager Exp. Publ., 3 : 1-94, 1926. *Purchased. Joicey Library.*
- BUGNION (E.). Les papilles caudales du grand Lampyre algérien *Pelania mauretanicus*.  
Bull. biol., 67 : 461-473, text illust., 1933. *The Author.*
- BYERS (C. F.). *Progomphus dorsopallidus*, a new species from Venezuela (Odonata, Gomphinae).  
Occ. Pap. Mus. Zool. Univ. Mich., 294 : 1-5, 2 pls., 1934.
- CAMERON (M.). Coleoptera of the Siju Cave, Garo Hills, Assam. New species of STAPHYLINIDAE.  
Rec. Ind. Mus., 26 : 118-119, 1924.

- CAMPOS (F.). Nuestras mariposas gigantes: el genero *Caligo*.  
Rev. Col. Rocafuerte, **12**: 14-18, 1930. *Imp. Institute of Entomology.*
- CAMPOS (F.). Contribución al estudio de los mosquitos que habitan la ciudad y zonas adyacentes.  
(7a. memoria referente a dichos insectos.)  
Rev. Col. Rocafuerte, **12**: 1-11, 1930. *Imp. Institute of Entomology.*
- CAMPOS (F.). Mis afortunadas pesquisas entomologicas. (85 especies nuevas de insectos ecuatorianos.)  
Rev. Col. Rocafuerte, **12**: 27-45, 2 pls., 1930. *Imp. Institute of Entomology.*
- CAMPOS (F.). Entomologia medica. Mosquitos peligrosos. (8a. Memoria referente al estudio de estos insectos.)  
Rev. Col. Rocafuerte, **12**: 23-25, 1930. *Imp. Institute of Entomology.*
- CARADJA (A.). Die Kleinfalter des Stötzner'schen Ausbeute, nebst Zutraege aus meiner Sammlung. [Zweite biogeographische Skizze "Zentralasien."]  
Acad. rom. Mem. Sect. ştiinţ., (3) **4** (8): 1-68, 1927.  
Vorläufige Mitteilung.  
Acad. rom. Butl. Sect. ştiinţ., **11**: 34-37, 1928.
- CARADJA (A.). Contribuţiune la Cunoaşterea Lepidoptereleor Românei Mari.  
Acad. rom. Mem. Sect. ştiinţ., (3) **6** Mem. 2: 1-3, 1929. *Purchased. Joicey Library.*
- CARADJA (A.).  
1. *Evergestis ostrogovichii*, nov. spec.  
2. *Antigastrea catalannalis* Dup. nov. ab. *sionensis*, eine noch unbeschriebene Pyraliden-form aus Palästina.  
3. Über *Phlyctaenodes subhyalinalis* Hmps.  
Bull. Sect. sci. Acad. roumaine, **12** No. 6: 1-3, 1929. *Purchased. Joicey Library.*
- CARADJA (A.). Beitrag zur Lepidopterenfauna der südlichen Dobrogea, insbesondere der sogenannten "Coasta de Argint."  
Bull. Sect. sci. Acad. roumaine, **13**: 31-51, 5 pls., 1 map, 1930. *Purchased. Joicey Library.*
- CARADJA (A.). Eine neue Geometride aus Siebenbürgen.  
Bull. Sect. sci. Acad. roumaine, **13**: 52, 1930. *Purchased. Joicey Library.*
- CARADJA (A.). Second contribution to our knowledge about the PYRALIDAE and Microlepidoptera of Kwanhsien.  
Bull. Sect. sci. Acad. roumaine, **14**: 59-75, 1931. *Purchased. Joicey Library.*
- CARPENTER (G. D. H.). Some notes on the Northern Islands of Lake Victoria.  
J. Anim. Ecol., **3**: 91-104, 2 pls., 2 maps, 1934. *The Author.*
- CLARK (A. F.). The food of some insects.  
N.Z.J. Sci. Tech., **11**: 366-370, 1930.  
(Also forms Cawthron Inst., For. biol. Res. Stat. Publ. 1.) *Purchased. Joicey Library.*
- CLARK (B. P.). Thirty-three new SPHINGIDAE.  
Proc. New Engl. Zool. Cl., **8**: 47-77, 1923. *Purchased. Joicey Library.*
- CLARK (B. P.). Twelve new SPHINGIDAE.  
Proc. New Engl. Zool. Cl., **9**: 11-21, 1924. *Purchased. Joicey Library.*
- CLARK (B. P.). Sundry notes on SPHINGIDAE and descriptions of ten new forms.  
Proc. New Engl. Zool. Cl., **10**: 33-46, 1928. *Purchased. Joicey Library.*
- CLARK (B. P.). Sundry notes on SPHINGIDAE, descriptions of sixteen new forms, and of one new genus.  
Proc. New Engl. Zool. Cl., **11**: 7-24, 1929. *Purchased. Joicey Library.*
- CLARK (B. P.). Sundry notes on SPHINGIDAE and descriptions of seven new forms.  
Proc. New Engl. Zool. Cl., **12**: 25-30, 1930. *Purchased. Joicey Library.*
- COCKERELL (T. D. A.). Some Eocene insects from Colorado and Wyoming.  
Proc. U.S. Nat. Mus., **59**: 29-39, 1 pl., text illust., 1921.
- COCKERELL (T. D. A.). Some bees of the genus *Ceratina* from Africa.  
Amer. Mus. Nov., **736**: 1-4, 1934. *The Author.*
- CODINA (A.). Recull de Dipters de Catalunya. V. Fam. DOLICHOPODIDAE.  
Butl. Inst. catal. Hist. nat., (2) **3**: 81-82, 1923. *Imp. Institute of Entomology.*
- COUSIN (G.). Étude biologique d'un Chalcidien: *Mormoniella vitripennis* Walk.  
Thèse présentée à la Faculté des Sciences de Paris, etc. Ser. A, no. 1362. 1932.  
Bull. biol., **1933**: 371-400, text illust., 1933. *The Authoress.*
- COUSIN (G.). Étude expérimentale de la diapause des insectes.  
Bull. biol. Suppl., **15**: 1-341, 37 tab., text figs., 1932. *The Authoress.*



- COUSIN (G.). Sur la fécondité normale et les caractères des hybrides issus du croisement de deux espèces de Gryllides. (*Achaeta campestris* L. et *A. bimaculata* de Geer.)  
C.R. Acad. Sci. Paris, **198** : 853-855, 1934. *The Authoress.*
- CURRAN (C. H.). Notes on the SYRPHIDAE in the Slosson collection of Diptera.  
Amer. Mus. Nov., **724** : 1-7, 1934. *Imp. Institute of Entomology.*
- CURRAN (C. H.) and others. The Diptera of Kartabo . . . British Guiana, with descriptions of new species from other British Guiana localities.  
Bull. Amer. Mus. nat. Hist., **66** : 287-532, illust., 1934.
- CURTIS (W. P.). Notes on *Eumichtis* (*Hadena*) *adusta* Esp. var. *pavida* = *chardingi*.  
Proc. Bournemouth nat. Sci. Soc., **2** : 100-103, 1911. *Purchased. Joicey Library.*
- CUTHBERTSON (A.). Biological notes on some Diptera in Southern Rhodesia.  
Proc. Rhod. sci. Ass., **33** : 32-50, 1934. *The Author.*
- DARLINGTON (P. J.), jr. Four new Bembidiini (Coleoptera : CARABIDAE) from Costa Rica and Colombia.  
Occ. Pap. Boston Soc. nat. Hist., **8** : 157-161, 1934.
- DAVIES (W. M.). The Collembola of North Wales. Zone I. Mountain. (a) Soil fauna.  
Northw. Nat., **9** : 115-124, 1934. *Prof. Buxton.*
- DE HAAN (W.). Bijdragen tot de Kennis der Papilionidea [of Dutch East Indies]. pp. 1-44, 9 pls. col. fol. (1840).  
Verh. Nat. Geschied. Ned. Overzee. Bezitt.
- DE HAAN (W.). Bijdragen tot de Kennis der Orthoptera [of Dutch East Indies]. pp. 45-248, pls. 10-23 col. fol. (1842-43).  
Verh. Nat. Geschied. Ned. Overzee. Bezitt.
- DEICHMUELLER (J. V.). Fossile Insecten aus dem Diatomeenschiefer von Kutschlin bei Bilin, Böhmen.  
Nova Acta Leop.-Carol., **42** : 295-331, 1 pl., 1881.
- DEWITZ (H.). Beschreibungen von Jugendstadien exotischer Lepidopteren.  
Nova Acta Leop.-Carol., **44** : 248-271, 2 pls., 1882.
- DOHERTY (W.). New and rare Indian LYCAENIDAE.  
J. Asiat. Soc. Beng., **60** : 32-38, 1 pl., 1891.  
[Wanting the plate.] *Purchased. Joicey Library.*
- DUFOUE (L.). Mémoire pour servir à l'histoire du genre *Ocyptera*.  
Ann. Sci. nat., **10** : 6-18, 1827.
- EKBLOM (T.). Morphological and biological studies of the Swedish families of Hemiptera-Heteroptera. Part I. The families SALDIDAE, NABIDAE, LYGAEDAE, HYDROMETRIDAE, VELIIDAE, and GERRIDAE. Academical dissertation.  
Zool. Bidr. Uppsala, **10** : 31-179, text illust., 1926. *Purchased.*
- ENDERLEIN (G.). Federlinge und Haarlinge, Mallophaga [of Central Europe].  
Tierwelt Mitteleur., **4** (VII) : 17-24, text illust., [1927]. *Mr. J. Cowley.*
- ENDERLEIN (G.). Flechtlinge, Copeognatha [of Central Europe].  
Tierwelt Mitteleur., **4** (VII) : 1-16, text illust., [1927]. *Mr. J. Cowley.*
- ESCHERICH (K.). Beiträge zur Kenntnis der Ökologie und Systematik blattminierender Insekten. (Minenstudien X.)  
Z. angew. Ent., **17** : 431-471, 2 pls., text illust., 1930. *Purchased. Joicey Library.*
- FABRICIUS (J. C.). Beskrivelse over den skadelige Sukker- og Bomulds-Orm i Vestindien, og om *Zygaenae* Pugionis Forvandling.  
Skrivt. Naturhist. Selskab., **3** : 63-67, 1 pl., 1794.  
[Photostat copy.] *Mr. W. H. T. Tams.*
- FAIRCHILD (G. B.). Notes on TABANIDAE.  
Occ. Pap. Boston Soc. Nat. Hist., **8** : 139-144, 1 pl., 1934. *The Society.*
- FEREDAY (R. W.). Description of new genera and species of PSYCHIDAE.  
Trans. N.Z. Inst., **10** : 260-262, 1 pl., [1878].  
[Annotated by the author.] *Purchased. Joicey Library.*
- FEREDAY (R. W.). Supplementary description of species or varieties of Chrysophani (Lepidoptera Rhopalocera) inhabiting New Zealand.  
Trans. N.Z. Inst., **10** : 252-258, 1 pl., [1878 ?]  
[Annotated by the author.] *Purchased. Joicey Library.*
- FERREIRA D'ALMEIDA (R.). Étude sur le genre *Terias*.  
Rev. chil. Hist. nat., **33** : 421-427, text illust., 1929. *Purchased. Joicey Library.*
- FETTIG (J.). Notizen über verschiedene Schmetterlings-Abänderungen aus dem Elsaße.  
Dobiasch. Ent. Almanack, **1889** : 40-43, 1889.  
[Photostat copy.] *Dr. Walther Horn.*

- FIELD (W. L. W.). A contribution to the study of individual variation in the wings of Lepidoptera.  
Proc. Amer. Acad. Arts Sci., **33** : 389-396, text figs., 1898. *Prof. Cockerell.*
- FISHER (W. S.). New species of Buprestid beetles from Mexico and Central America.  
Proc. U.S. nat. Mus., **82** Art. 27 : 1-47, 1933. *The Smithsonian Inst.*
- FLEUTIAUX (E.). Coleoptera of the Siju Cave, Garo Hills, Assam. ELATERIDAE.  
Rec. Ind. Mus., **26** : 119, 1924.
- FOORD (A. S.). Notes on a collection of East Coast amber belonging to Mrs. Burwood of Yarmouth.  
Trans. Norfolk Norw. Nat. Soc., **5** : 92-95, 1 pl. col., 1890.
- FORBES (W. T. M.). Notes on West Indian SYNTOMIDAE and ARCTIDAE (Lepidoptera).  
Bull. Amer. Mus. nat. Hist., **37** : 339-345, text illust., 1917.  
*Purchased. Joicey Library.*
- FRASER (F. C.). Notes on Odonata collected in Seistan and Baluchistan in winter.  
Rec. Ind. Mus., **18** : 79-82, text illust., 1919.
- FRIEDERICH (K.). Grundsätzliches über die Lebenseinheiten höherer Ordnung und den ökologischen Einheitsfaktor.  
Naturwissenschaften, **15** : 153-157; 182-186, text fig., 1927.  
*Purchased. Joicey Library.*
- FRIESE (H.). Namenänderungen für einige Apiden (Hym.).  
Arch. Naturges., **78**, A. 12 : 89, 1913.
- FRIESE (H.). Über einige neue Apiden (Hym.).  
Arch. Naturges., **78**, A. 12 : 85-89, 1913.
- GADEAU DE KERVILLE (H.). Note sur les fonctions de la pince des insectes Orthoptères de la famille des Forficulidés.  
Bull. Soc. zool. Fr., **30** : 53-63, text illust., 1905. *Dr. M. Burr.*
- GEINITZ (F. E.). Die Blattinen aus der unteren Dyas von Weissig bei Pillnitz.  
Nova Acta Leop.-Carol., **41** : 423-442, 1 pl., 1880.
- GESTRO (R.) and VINCIGUERRA (D.). La fauna [of the Oasis of Giarabùb].  
Res. sci. Miss. Oasi di Giarabùb., pp. 531-549, 1931.
- GESTRO (R.) and VINCIGUERRA (D.). La fauna all Bacino dello Uabi-Uebi Scebeli. AbruZZi, Duke of, La Esplorazione dello Uabi-Uebi Scebeli. [n.d.] pp. 499-515.  
[The expedition was in 1928-29.]
- GEYSKENS (J.). Introduction à l'étude des Hyménoptères aculéates.  
Bull. mens. Nat. belges, **2** : 21-24, text illust., 1931.
- GIACOMELLI (E.). Sobre una forma de *Dione vanillae* L.  
Rev. chil. Hist. nat., **29** : 228-229, text illust., 1925. *Purchased. Joicey Library.*
- GIACOMELLI (E.). Descripción de dos nuevas formas de SATURNIADAE del género *Dysdaemonia* de la Preia, de la Rioja (R.A.).  
Rev. chil. Hist. nat., **29** : 151-153, 1925. *Purchased. Joicey Library.*
- GLOYD (L. K.). A new Corduline Dragonfly, *Tetragoneuria sepia*, from Florida. (Odonata.)  
Occ. Pap. Mus. Zool. Univ. Michigan, **274** : 1-5, text illust., 1933.  
*University of Michigan.*
- GRAVELY (F. H.). An account of the Oriental PASSALIDAE (Coleoptera) based primarily on the collection in the Indian Museum.  
Mem. Ind. Mus., **3** : 177-353, 3 pls., text illust., 1914. *The Author.*
- GRAVELY (F. H.). A contribution towards the revision of the PASSALIDAE of the world.  
Mem. Ind. Mus., **7** : 1-144, 1 pl., text illust., 1918. *The Author.*
- GRIMSHAW (P. H.). On some type specimens of Lepidoptera and Coleoptera in the Edinburgh Museum of Science and Art.  
Trans. Roy. Soc. Edinb., **39** : 1-11, 1 pl. col., 1897. *Purchased. Joicey Library.*
- GRIMSHAW (P. H.). On a melanic specimen of *Hestina nama*, Doubleday.  
Trans. Roy. Soc. Edinb., **39** : 13-14, 1897. *Purchased. Joicey Library.*
- GROSSBECK (J. A.). Insects of Florida. IV. Lepidoptera. (Edited by F. E. Watson.)  
Bull. Amer. Mus. nat. Hist., **37** : 1-147, 1917. *Purchased. Joicey Library.*
- GROTE (A. R.). On eight species of NOCTUIDAE.  
Bull. Buffalo Soc. Nat. Sci., **1873** : 190-194, 1 pl., 1873.  
*Purchased. Joicey Library.*
- HALL (W. J.) and FORD (W. K.). Notes on some Citrus insects of Southern Rhodesia.  
Publ. Mazoe Citrus Exp. Sta., **2a** : 1-51, 1 map, text figs., 1933. *Dr. W. J. Hall.*
- HALLETT (H. M.). Entomological Notes.  
Trans. Cardiff Nat. Soc., **45-59**, 1913-1928. *The Author.*



- HALLETT (H. M.). The Neuroptera of Glamorgan.  
Trans. Cardiff Nat. Soc., **62** : 67-69, 1931. *The Author.*
- HALLETT (H. M.). The Orthoptera of Glamorgan.  
Trans. Cardiff Nat. Soc., **62** : 70-72, 1931. *The Author.*
- HALLETT (H. M.) and NORTON (F.). Entomological Notes [1927]-1929.  
Trans. Cardiff Nat. Soc., **60-62**, 1928-1931.
- HARRIS (T. W.). Description of an African beetle allied to *Scarabeus polyphemus* with remarks upon some other insects of the same group.  
Boston J. Nat. Hist., **4** : 397-405, 1 pl., 1844.
- HELLER (K. M.). Käfer aus dem Bismarck- und Salomo-Archipel.  
Verh. naturf. Ges. Basel, **45** : 1-34, 1 pl., 1934. *The Author.*
- HERING (M.). Voyage de . . . le Prince Leopold de Belgique (1925). Lepidoptera. 4.  
Description d'un Lasiocampide nouveau. (*Lechriolepis leopoldi* nov. spec.)  
Rev. zool. afr., **17** : 237-239, text illust., 1929. *Purchased. Joicey Library.*
- HERING (M.). Description d'un Notodontide et d'un Sphingide nouveaux du Congo Belge récoltés par S. M. la Reine Elisabeth.  
Rev. zool. afr., **17** : 405-407, text illust., 1930. *Purchased. Joicey Library.*
- HERING (M.). Minenstudien 12.  
Z. PflKrankh., **41** : 529-551, text illust., 1931. *Purchased. Joicey Library.*
- HERING (M.). Synopsis der Ahorn-Minen.  
Ent. Jb., **43** : 66-74, text illust., 1934.
- HESSE (A. J.). Contributions to a knowledge of the fauna of South-West Africa. IV. A list of the Heteropterous and Homopterous Hemiptera of South-West Africa.  
Ann. S. Afr. Mus., **23** : 1-190, 8 pls., 1925. *The Author.*
- HOLLAND (W. J.). Notes on some American butterflies, mainly relating to their classification and nomenclature. 3 Parts. Part I. PAPILIONIDAE, PIERIDAE, NYMPHALIDAE (DANAINAE). Part II. NYMPHALIDAE, etc.  
Ann. Carnegie Mus., **19** : 185-204, 1930.  
— **20** : 39-55, 1930.  
— **20** : 255-265, 1930. *Purchased. Joicey Library.*
- HORN (W.). How to collect Cicindelids and their larvae in Hong Kong and vicinity.  
Hong Kong Nat., **2** : 258-261, text illust., 1931. *Imp. Institute of Entomology.*
- HUDSON (G. V.). On Macro-Lepidoptera observed during the summer of 1903-4, including a note on the occurrence of a Hawk-moth new to New Zealand.  
Trans. N.Z. Inst., **37** : 359-361, 1 pl. col., 1904. *Purchased. Joicey Library.*
- HUDSON (G. V.). On some new species of Macro-Lepidoptera in New Zealand.  
Trans. N.Z. Inst., **37** : 355-357, 1 pl. col., 1904. *Purchased. Joicey Library.*
- HUDSON (G. V.). Recent observations on New Zealand Macro-Lepidoptera, including descriptions of new species.  
Trans. N.Z. Inst., **40** : 104-107, 1 pl. (col.), 1907. *Purchased. Joicey Library.*
- ILLINGWORTH (J. F.). Early references to Hawaiian entomology.  
Bern. P. Bishop Mus. Bull., **2** : 1-63, 1923. *Purchased. Joicey Library.*
- JACKSON (D. J.). Observations on the flight muscles of *Sitona* weevils.  
Ann. appl. Biol., **20** : 731-770, 2 pls., text illust., 1933. *The Authoress.*
- JANSE (A. J. T.). On the Heterocerous fauna of Southern Rhodesia.  
S. Afr. J. Sci., **15** : 708-711, 1919. *Purchased. Joicey Library.*
- JANSE (A. J. T.). Notes on the Hepialid genera *Gorgopis* and *Dalacca*, with descriptions of six apparently new South African species.  
Rec. Albany Mus., **3** : 233-246, 1 pl., 1919. *Purchased. Joicey Library.*
- JANSE (A. J. T.). On the South African NOTODONTIDAE, with descriptions of apparently new genera and species.  
Ann. Transv. Mus., **7** : 149-237, 14 pls. (col.), 1920. *Purchased. Joicey Library.*
- JANSON (O. E.). Coleoptera in Co. Kerry.  
Irish Nat., **29** : 1-6, 1920.
- JOBLING (B.). A new species of the genus *Raymondia* Frauenfeld (Diptera Pupipara; STREBLIDAE) with a note on *Raymondia quadriceps* Jobling and *R. bedfordi* Ferris.  
Parasitology, **23** : 79-83, text illust., 1931. *Prof. Buxton.*
- JOHNSON (W. F.). Irish ICHNEUMONIDAE and BRACONIDAE.  
Irish Nat., **29** : 7-10, 1920.
- JORDAN (K.). Nova Guinea, Résultats de l'expédition scientifique néerlandaise à la Nouvelle-Guinée, sous . . . A. Wichmann, etc. ANTHREBIDAE, by Karl Jordan.  
Wichmann, Nova Guinee, Zool., **5** : 351-352, 1908.

- JÖRGENSEN (P.). Las Mariposas argentinas. (Lep.) Familia PIERIDAE.  
An. Mus. nac. B. Aires, **28** : 427-520, 1916. *Purchased. Joicey Library.*
- JÖRGENSEN (P.). Sobre algunos nuevos enemigos de la Yerba-mate *Ilex paraguariensis*.  
Rev. Soc. cient. Paraguay, **1** : 27-30, 1924. *Purchased. Joicey Library.*
- JÖRGENSEN (P.). Sobre dos casos de hermaphroditismo en las mariposas. (Lep.)  
Rev. Soc. cient. Paraguay, **1** : 89-90, 1924. *Purchased. Joicey Library.*
- JÖRGENSEN (P.). Observaciones biologicas de Lepidopteros sudamericanos.  
Rev. Soc. cient. Paraguay, **1** : 84-89, 1924. *Purchased. Joicey Library.*
- JUNOD (H. A.). La faune entomologique de Delagoa.  
Bull. Soc. neuchâtel. Sci. nat., **27** : 176-251, 4 pls. col., 1900.  
*Purchased. Joicey Library.*
- KLUIJVER (I. H. N.). Bijdrage tot de Biologie en de Ecologie van den Spreeuw (*Sturnus vulgaris*  
*vulgaris* L.) gedurende zijn voortplantingstijd.  
Mededeel. Plantenziek. Dienst Wageningen, **69** : 1-146, 3 pls., text figs., 13 tab., 1933.  
*The Author.*
- KRULIKOWSKY (L. K.). [Notice on some Lepidoptera of the district around Saratov.]  
Sarat. zemsk. Ned., **1897** : 1-6, 1897.  
[Photostat copy.] In Russian. *Dr. Walther Horn.*
- KUSNEZOV (N. J.). Some new Eastern and American elements in the fauna of Lepidoptera of  
Polar Europe.  
C.R. Acad. Sci. U.R.S.S., **1925** : 119-122, 1925. *Purchased. Joicey Library.*
- KUSNEZOV (N. J.). The morphology of the copulatory structures in some cases of gynandro-  
morphism in Lepidoptera.  
Biol. Bull., **51** : 245-256, text ill., 1926. *Purchased. Joicey Library.*
- KUSNEZOV (N.). *Oligamatites martynovi*, gen. et sp. nn., a fossil Amatid Lepidopteron from the  
Oligocene beds of Central Asia.  
C.R. Acad. Sci. U.R.S.S., **1928** : 431-436, text ill., 1928.  
*Purchased. Joicey Library.*
- LAMPRECHT (H.). Die Goldwespen Deutschlands. Abhandlung mit Bestimmungstabellen und  
Steindrucktafel.  
Osterprogr. Zerbst, **1880** : i-xxvi, 1 pl., 1881. *Purchased.*
- LANGHAM (C.). Some Irish records of Dragonflies.  
Irish Nat., **29** : 11-12, 1920.
- LESNE (P.). Les Longicornes du genre *Phosphorus*.  
Nouv. Arch. Mus. Hist. nat. Paris, (5) **6** : 1-24, 1 pl., text ill., 1914.
- LESNE (P.). Un Chalcidide nuisible à l'amandier dans la région syrienne.  
Ann. Epiphyt., **6** : 228-241, text ill., 1919.
- LIMA (A. DA C.). Sobre as especies dos generos *Sabethes* e *Sabethoides*. (Diptera : CULICIDAE.)  
Mem. Inst. Oswaldo Cruz, **25** : 51-64, 3 pls., 1931.
- LIMA (A. DA C.). Sobre especies do genero *Miamyia*, subgenero *Miamyia*. 2 Parts. (Diptera :  
CULICIDAE.)  
Mem. Inst. Oswaldo Cruz, **24** : 73-78, 3 pls.; 187-194, 3 pls., 1930.
- LIMA (A. DA C.). Nota sobre a *Wyeomyia (Dendromyia) luteoventralis* Theobald, 1901. (Diptera :  
CULICIDAE.)  
Mem. Inst. Oswaldo Cruz, **24** : 35-39, 3 pls., 1930.
- LIMA (A. DA C.). Sobre o *Pseudococcus cryptus* Hempel, praga do cafeeiro e da laranjeira. (Homo-  
ptera : COCCIDOIDEA.)  
Mem. Inst. Oswaldo Cruz, **23** : 35-39, 2 pls., 1930.
- LIMA (A. DA C.). Sobre a revalidação do genero *Taeniorhynchus* F. Lch. A. (Diptera :  
CULICIDAE.)  
Mem. Inst. Oswaldo Cruz, **23** : 105-108, 1930.
- LIMA (A. DA C.). Sobre os mosquitos que se criam em buracos de arvores.  
Mem. Inst. Oswaldo Cruz, **23** : 255-260, 2 pls., text ill., 1930.
- LIMA (A. DA C.). Sobre insectos que vivem em maracujás (*Passiflora* spp.).  
Mem. Inst. Oswaldo Cruz, **23** : 159-162, 3 pls., 1930.
- LIMA (A. DA C.). Nota sobre sabethineos do grupo *Joblotia*.  
Mem. Inst. Oswaldo Cruz, **25** : 65-71, 9 pls., 1931.
- LIMA (A. DA C.). Sobre as especies de *Megarhinus* do Brasil. (Diptera : CULICIDAE.)  
Mem. Inst. Oswaldo Cruz, **25** : 307-315, 2 pls., 1931.
- LIMA (A. DA C.). Sobre os phlebotomos americanos. (Diptera : PSYCHODIDAE.)  
Mem. Inst. Oswaldo Cruz, **26** : 15-69, 28 pls., 1932.



- LIMA (A. DA C.). Sobre um novo *Aedes (Ochlerotatus)* do Brasil.  
Mem. Inst. Oswaldo Cruz, **27** : 403-406, 1 pl., 1933.
- LINDSEY (A. W.) and others. The Hesperioidea of North America.  
J. Sci. Labs. Denison Univ., **26** : 1-142, illust., 1931. *Purchased.*
- LUCAS (W. J.). Surrey Dragon-flies.  
J.R. Hort. Soc. Gdns. Cl., **2** : 29-31, 1909.
- MCATEE (W. L.). Revision of the American leaf-hoppers of the Jassid genus *Typhlocyba*.  
Proc. U.S. nat. Mus., **68** Art. 18 : 1-47, 6 pls., 1926.
- MCDUNNOUGH (J.). Notes on the biology of certain Tortricid species with structural details of the larvae and pupae.  
Canad. J. Res., **9** : 502-517, text illust., 1933. *Dept. of Agriculture, Ottawa.*
- MCILROY (W. D.). Hymenoptera [from Southampton Island].  
Mem. Carnegie Mus., **12** : 33, 1934. *Imp. Institute of Entomology.*
- MAHDIHASSAN (S.). The males of lac and pseudo-lac insects.  
Z. wiss. Zool., **138** : 371-385, text illust., 1931. *The Author.*
- MAHDIHASSAN (S.). Das zweite Larvenstadium der weiblichen Lackschildlaus.  
Zool. Anz., **94** : 289-304, text illust., 1931. *Mr. Hemming.*
- MALLOCH (J. R.). CHIRONOMIDAE, SCIARIDAE, PHORIDAE, SYRPHIDAE, PIOPHILIDAE, HELOMYZIDAE, CALLIPHORIDAE, OESTRIDAE, and TACHINIDAE [from Southampton Island].  
Mem. Carnegie Mus., **12** : 13-32, text illust., 1934. *Imp. Institute of Entomology.*
- MARSHALL (G. A. K.). New CURCULIONIDAE (Col.) from Mt. Ruwenzori.  
Rev. zool. bot. afr., **24** : 66-74, text illust., 1933. *Imp. Institute of Entomology.*
- MEHTA (D. R.). On the development of the male genitalia and the efferent genital ducts in Lepidoptera.  
Quart. J. Micr. Sci., **76** : 35-61, text illust., 1933. *Dr. A. D. Imms.*
- METCALFE (M. E.). Some CECIDOMYIDAE attacking the seed of *Dactylis glomerata* L. and *Lolium perenne* L.  
Ann. appl. Biol., **20** : 327-341, 1933. *Rothamsted Exp. Station.*
- METCALFE (M. E.). *Dasyneura leguminicola* (Lint.) the clover seed midge.  
Ann. appl. Biol., **20** : 185-204, 1 pl., text figs., 1933. *Rothamsted Exp. Station.*
- METCALFE (M. E.). Notes on the structure and development of the female genital system in *Dasyneura leguminicola* Lint. (CECIDOMYIDAE, Diptera.)  
Quart. J. Micr. Sci., **76** : 89-105, 2 pls., text illust., 1933. *Rothamsted Exp. Station.*
- MEYRICK (E.). Exotic Microlepidoptera, Vol. **4**, pts. 15-17, 1934. *The Author.*
- MICKEL (C. E.). A new species and subspecies of MUTILLIDAE from the Orient.  
Lingnan Sci. J., **12** : 283-288, 1933. *Prof. Buxton.*
- MICKEL (C. E.). The MUTILLIDAE of Eastern Asia.  
Lingnan Sci. J., **12** : 289-324, 1933. *Prof. Buxton.*
- MUTCHLER (A. J.). New species of CARABIDAE from Puerto Rico.  
Amer. Mus. Nov., **686** : 1-5, 1934. *Prof. Cockerell.*
- NEWTON (H. C. F.). On the biology of *Psylliodes hyoscyami* Linn. (CHRYSEMELIDAE, Coleoptera), the henbane flea-beetle, with descriptions of the larval stages.  
Ann. appl. Biol., **21** : 153-161, 2 pls., text illust., 1934. *Rothamsted Exp. Station.*
- NORTH (F. J.). Insect life in the coal forests, with special reference to South Wales.  
Trans. Cardiff Nat. Soc., **62** : 16-44, 3 pls., text illust., 1931. *Mr. H. M. Hallett.*
- NORTON (F.). The Paraneuroptera of Glamorgan.  
Trans. Cardiff Nat. Soc., **62** : 73-75, 1931. *Mr. H. M. Hallett.*
- OHAUS (F.). Neue RUTELINAE (Col. SCARABEIDAE) des Belg. Congo Museums.  
Rev. zool. bot. afr., **24** : 124-127, text illust., 1933. *Imp. Institute of Entomology.*
- ÔUCHI (Y.). Bibliographical introduction to the study of Chinese insects. (Entomological report, no. 1.)  
J. Shanghai Sci. Inst., (Sect. 3) **2** : 1-533, 1934. *Shanghai Science Institute.*
- PAGAST (F.) and FROESE (H.). Beitrag zur Kenntnis der Quellenfauna Lettlands.  
Mitt. Inst. wiss. Heimatforsch., **9** : 3-32, text illust., 1933.
- PETERS (H. S.). Mallophaga from birds of Southampton Island, Hudson Bay.  
Mem. Carnegie Mus., **12** : 35-37, 1934.
- PINTO (C.). Mosquitos do região neotropical (Brasil, S. Paulo). I. (— Brasil, Estados de S. Paulo e Rio de Janeiro.) II. (Diptera : CULICIDAE.)  
Mem. Inst. Oswaldo Cruz, **23** : 153-157, 3 pls.; 179-184, 6 pls., 1930.

- PLAVILSTSHIKOV (N. N.). [Cerambycid beetles injuring Lignum.] (In Russian.)  
Gosud. Lesn. tekhn. Izd., 1932 : 1-200, text illust., 1932. *Imp. Institute of Entomology.*
- PRIESNER (H.). Fransenflügler, Blasenfüsse. Thysanoptera (Physopoda) [of Central Europe].  
Tierwelt Mitteleurop., 4 (VIII) : 1-18, text illust., [1927]. *Mr. J. Cowley.*
- PROUT (A. E.). Noctuid moths from some of the mountains of Sarawak.  
Sarawak Mus. J., 3 : 211-241, 1 pl., 1926.
- PROUT (L. B.). An account of some Geometrid moths collected in Sarawak.  
Sarawak Mus. J., 3 : 169-210, 1 pl., 1926.
- RAMME (W.). Geradflügler, Orthoptera [of Central Europe].  
Tierwelt Mitteleurop., 4 (VI) : 1-22, 1 pl., text illust., [1927]. *Mr. J. Cowley.*
- RÖEBUCK (W. D.). Hymenoptera of the East Riding of Yorkshire.  
Trans. Hull Sci. F. Nat. Cl., 3 : 279-284, 1907.
- RUDOW ( ). Die Wohnungen der Raub- Grab- und Faltenwespen. Sphegiden, Crabroniden, Vespiden.  
Wiss. Beil. Jber. Realgym. Perleberg, 43 : 1-48, 1905. *Purchased.*
- SCHOENEMUND (E.). Steinfliegen, Uferfliegen, Plecoptera [of Central Europe].  
Tierwelt Mitteleurop., 4 (V) : 1-18, text illust., [1927]. *Mr. J. Cowley.*
- SEMPER (G.). Auf der Insel Yap gesammelte Schmetterlinge und deren Verwandlungsgeschichte.  
J. Mus. Godeffroy, 2 : 1-6, 1 pl. col., 1872.
- SEYRIG (A.). Les Ichneumonides de Madagascar. 2. ICHNEUMONIDAE TRYPHONINAE et supplément aux 1. PIMPLINAE.  
Mém. Acad. malgache, 19 : 1-111, 8 pls., 1934. *The Author.*
- SINTON (J. A.). A new African Sandfly—*Phlebotomus transvaalensis* n. sp.  
Ind. J. Med. Res., 20 : 879-881, 1 pl., 1 tab., 1933. *Malaria Survey of India. Kasauli.*
- SMITH (J. B.). The role of insects in the forest.  
Rep. Geol. New Jers., 1899 : 205-232, text illust., 1900.
- SMITH (J. B.). The Salt-marsh mosquito, *Culex sollicitans*, Wlk.  
Bull. New Jers. Agric. Expt. Stas., T : 1-10, text illust., 1902.
- STAINFORTH (T.). East Riding Coleoptera in 1906.  
Trans. Hull Sci. F. Nat. Cl., 3 : 293-294, 1907.
- STONE (A.). CULICIDAE [collected by G. M. Sutton on Southampton Island].  
Mem. Carnegie Mus., 12 : 11, 1934. *Imp. Institute of Entomology.*
- STRAND (E.). Weitere Schmetterlinge aus Kamerun, gesammelt von Herrn I. E. Hintz.  
Arch. Naturgesch., 78, A. 12 : 121-131, 1913.
- STRAND (E.). Lepidoptera aus dem belgischen Kongo.  
Arch. Naturgesch., 78 A. 12 : 89-100, 1913.
- STRAND (E.). Zoologische Ergebnisse der Expedition des Herrn G. Tessman nach Süd-Kamerun und Spanisch-Guinea. Lepidoptera. IV.  
Arch. Naturgesch., 78, A. 12 : 30-84, 2 pls., 1913.
- SUBRAMANIAM (T. V.). The Lantana seedfly in India, *Agromyza (Ophiomyia) lantanae* Froggatt.  
Indian J. agric. Sci., 4 : 468-470, 1 pl., 1934. *Imp. Council for Agricul. Research.*
- SZILADY (Z.). Die grösste deutsche Erinnide. Eine vorläufige Mitteilung, &c.  
in Junk (W.) [Sale] Catalogue 79, Diptera, p. i, fig., 1932.
- TALBOT (G.). On some families of Heterocera collected in Sarawak.  
Sarawak Mus. J., 3 : 129-146, 1 pl., 1926.
- THEOBALD (F. V.). The CULICIDAE or Mosquitoes of the Transvaal.  
Rep. Vet. Res. S. Afr., 1 : 232-272, 11 pls., text illust., 1911. *Mr. H. K. Munro.*
- THEOBALD (F. V.). Second report on the Mosquitoes of the Transvaal.  
Rep. Vet. Res. S. Afr., 2 : 315-342, 2 pls., 1913. *Mr. H. K. Munro.*
- TURATI (E.). Lepidotteri della spedizione di S.A.R. il Duca di Spoleto al Caracorum nel 1929.  
Atti. Soc. ital. Sci. nat., 72 : 191-208, 1933. *The Author.*
- TURATI (E.). Novità di Lepidotteriologia in Cirenaica. IV.  
Atti. Soc. ital. Sci. nat., 73 : 159-212, 1 pl., text illust., 1934. *The Author.*
- VAN EECKE (R.). Eukele opmerkingen omtrent Indo-australische Danaiden.  
Zool. Meded., 1 : 205-227, text illust., 1915. *Purchased. Joicey Library.*
- VAN EECKE (R.). *Antheraea brunnea*, nov. spec.  
Zool. Meded., 6 : 99-100, 1 pl., 1921. *Purchased. Joicey Library.*
- VAN EECKE (R.). A very remarkable Longicorn from Sumatra.  
Zool. Meded., 6 : 97-98, 1 pl., 1921. *Purchased. Joicey Library.*

- VAN EECHE (R.). List of the Lepidoptera collected by Mr. W. C. van Heurn during an exploration expedition in Dutch North New Guinea.  
Wichmann, Nova Guinea, **15** (Zool.): 33-56, 1 pl. col., 1924.  
*Purchased. Joicey Library.*
- VAN EMDEN (F.). Die larven von *Discoloma cassideum* Reitt. (Col. COLYD.) und *Skvarraia paradoxa* Lac. (Col. CHRYSOM.)  
Zool. Anz., **101**: 1-17, text illust., 1932.
- VAN EMDEN (F.). Revision der Gattung *Cratosomus* (Col. CURC.)  
Arch. Naturgesch. (n.f.) **2**: 354-537, pls. 2-5, text illust., 1933.
- WEBER (H.). Die Lebengeschichte von *Ectopsocus parvulus* (Kolbe 1882). Ein Beitrag zur Kenntnis der einheimischen Copeognathen.  
Z. wiss. Zool., **138**: 457-486, text illust., 1931.  
*Prof. Buxton.*
- WEISE (J.). Über Hispinen und Coccinelliden.  
Arch. Naturgesch., **78**, A. 12: 101-120, 1913.
- WERNECK (F. L.). Nova especie de Anoplura. (HAEMATOPINIDAE.)  
Mem. Inst. Oswaldo Cruz, **26**: 235-237, 2 pls., 1932.
- WERNECK (F. L.). Sobre as especies de Anoplura parasitas da Unama.  
Mem. Inst. Oswaldo Cruz, **27**: 21-32, text illust., 1933.
- WERNECK (F. L.). Sobre duas especies de Anoplura encontradas em ratos sylvestres do Brasil.  
Mem. Inst. Oswaldo Cruz, **27**: 407-415, text illust., 1933.
- WERNECK (F. L.). Sobre una nova especie de Mallophaga encontrada na chinchilla. (TRIMENOPONIDAE.)  
Mem. Inst. Oswaldo Cruz, **27**: 417-421, text illust., 1933.
- WERNECK (F. L.). Nova especie do genero *Tetragyropus*.  
Mem. Inst. Oswaldo Cruz, **27**: 153-158, text illust., 1933.
- WERNECK (F. L.). Nova especie do genero *Gliricola*. (Mallophaga, GYROPIDAE.)  
Mem. Inst. Oswaldo Cruz, **27**: 147-151, text illust., 1933.
- WERNECK (F. L.). Estudo sobre o *Trichodectes* do Furão (Mallophaga).  
Mem. Inst. Oswaldo Cruz, **28**: 161-165, text illust., 1934.
- WERNECK (F. L.). Sobre algunas especies brasileiras da ordem Mallophaga.  
Mem. Inst. Oswaldo Cruz, **28**: 167-176, text illust.; 277-285, text illust., 1934.
- WILLIAMS (C. B.). British immigrant insects.  
Trans. S.-E. Un. sci. Socs., **1934**: 1-12, 1 map, 1934.  
*Capt. Dannreuther.*
- WILLIAMS (L.). Notes on the biology of *Pseudococcus gahani*, Green.  
Ann. appl. Biol., **11**: 498-502, 1924.  
*Prof. Buxton.*
- WILLIAMSON (E. B.). Dragonflies collected in Kentucky, Tennessee, North and South Carolina, and Georgia in 1931.  
Occ. Pap. Mus. Zool. Univ. Mich., **288**: 1-20, 1934.
- WINN (A. F.) and BEAULIEU (G.). A preliminary list of the insects of the province of Quebec.  
Part I. Lepidoptera, by A. F. Winn.  
Part II. Diptera, by A. F. Winn and G. Beaulieu, revised and supplemented by C. E. Petch and J. B. Maltais.  
Suppl. Rep. Quebec Soc. Prot. Pl., **24**: 5-100, 1932.  
*Mr. A. F. Winn.*
- YERBURY (J. W.). The Diptera of Glamorgan.  
Trans. Cardiff Nat. Soc., **51**: 48-79, (1918) 1920.  
*Mr. Hallett.*
- ZIA (Y.). On the LANGURIDAE of the Provinces Kweichow.  
Sinensia, Nanking, **4**: 15-37, text illust., 1933.  
*Metropolitan Mus. of Nat. Hist., Nanking.*



## BENEFACCTIONS.

*List of Donations of the amount or value of Twenty pounds and upwards.*

- |   |       |
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\* It has not always been possible to find the exact purpose for which the earlier money gifts were intended, but they appear to have been usually in support of the publications.

1893.

The same, towards cost of publishing the Library Catalogue, £25.

1894.

The same, £45.

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1906.

The same, towards cost of plates for R. Trimen's paper on African Lepidoptera, £20.

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E. A. ELLIOTT (in this and subsequent years), Wytzman's "Genera Insectorum."

1909.

Ch. OBERTHÜR (in this and subsequent years), his "Lépidopterologie comparée."

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1919.

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The Misses CHAPMAN, two bookcases.

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## 1924.

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E. A. ELLIOTT, in continuation of his practice since 1908, Wytsman's "Genera Insectorum," amounting to a total value of £225.

THE ROYAL SOCIETY, £100, towards the cost of Mr. H. S. Pruthi's paper.

## 1926.

THE ROYAL SOCIETY, £150, towards the cost of Mr. Warren's paper.

## 1927.

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## 1928.

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## 1929.

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Prof. E. B. POULTON, F.R.S., authorised contribution from the Fund for promoting the study of organic and social evolution, presented to the University of Oxford by Professor J. Mark Baldwin, £85 11s.

THE ROYAL SOCIETY, £90, towards the cost of Mr. F. W. Edwards' paper.

## 1930.

R. W. LLOYD, the entire cost of the panelling and ceiling in the new Meeting Room, together with the Presidential Desk and Chair.

R. ADKIN, the entire cost of the Epidiascope and screen.

Dr. K. JORDAN, £50 donation in aid of building the new Meeting Room.

H. WILLOUGHBY ELLIS, £50 donation in aid of building the new Meeting Room.

Dr. R. STEWART MACDOUGALL, £110, being the cost of a bookcase and table for the Library, in memory of his wife.

JESUS COLLEGE, OXFORD, through Professor E. B. Poulton, F.R.S., £25.

Mdme. A. DE HORRACK-FOURNIER, cost of plate illustrating Mr. Lathy's paper, £20 5s.

THE TRUSTEES OF THE CARNEGIE (U. K.) FUND, £500 for the purchase of books for the Library.

Mrs. EATON, a selection of books from the Library of her husband.

E. A. ELLIOTT, in continuation of his practice since 1908, Wytsman's "Genera Insectorum."

P. I. LATHY, "Thésés entomologiques," copy No. 2, including a proof set of the plates uncoloured.

## 1931.

EMPIRE MARKETING BOARD, towards the cost of Mr. B. P. Uvarov's paper, £231.

Prof. E. B. POULTON, F.R.S., authorised contribution from the Fund for promoting the study of organic and social evolution; presented to the University of Oxford by Professor J. Mark Baldwin, £110.

JESUS COLLEGE, OXFORD, through Prof. E. B. Poulton, F.R.S., £20.

BOARD OF THE CARNEGIE FUND IN SOUTH AFRICA, the entire cost of the plates illustrating Prof. A. J. T. Janse's paper.

**1932.**

Prof. R. MELDOLA, legacy, £450.

Prof. E. B. POULTON, F.R.S., authorised contribution from the Fund for promoting the study of organic and social evolution; presented to the University of Oxford by Professor J. Mark Baldwin, £50.

JESUS COLLEGE, OXFORD, through Prof. E. B. Poulton, F.R.S., £30.

Dr. F. MORTON JONES, cost of plate illustrating his paper, £20 10s.

Donations to Centenary Fund—

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C. W. M. PRAED, £26 5s.

R. ADKIN, £25.

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Dr. H. ELTRINGHAM, F.R.S., £20.

**1933.**

Donations to Centenary Fund—

Prof. E. B. POULTON, F.R.S., £100.

Prof. W. A. F. BALFOUR-BROWNE, F.R.S.E., £20, making with a similar donation in 1932, £40 in all.

H. WILLOUGHBY ELLIS, £20.

Lord ROTHSCHILD, F.R.S., £20.

EMPIRE MARKETING BOARD, towards the cost of the paper by O. W. Richards and W. S. Thomson, £75.

THE HIGH COMMISSIONER FOR INDIA, towards the cost of the paper by U. S. Sharga, £30.

**1934.**

THE ROYAL SOCIETY, £75, towards the cost of Dr. O. W. Richards' paper.

Wednesday 7th November, 1934.

Dr. S. A. NEAVE, O.B.E., President, in the Chair.

*Election of Fellows.*

The following were elected Fellows of the Society:—Dr. ALFRED ERNEST CAMERON, 8, West Savile Road, Edinburgh; THOMAS WALLACE CHORLEY, The Agricultural Laboratory, Kampala, Uganda; WALTER DANNATT, 94, Guibal Road, Lee, S.E.12; Dr. R. U. HINGORANI, M.B., B.S., L.M., 8, Harley Street, W.1; EDWARD A. LEE, 60, Dawnay Road, Wandsworth Common, S.W.18.

*Obituary.*

The death of Mr. A. H. MARTINEAU, elected a Fellow in 1897, was announced.

*Exhibits.*

The following communications were made to the meeting:—

**Butterflies attracted to Dung, Sweat and Water.** By M. J. NORRIS (Mrs. O. W. RICHARDS).

Some butterflies taken in the Austrian Tyrol while drinking at dung, sweat and water were exhibited. Full details of these observations have been published in 1934, *Entomologist*, **67** : 280-283. Although water-drinking is so prevalent in the Alps it seems to be a comparatively rare occurrence in this country. There are a few records of Pierines and Lycaenids drinking on very hot days in places near the south coast. Visits of butterflies to patches of dung have, however, seldom been recorded. On one excessively hot day during the July heat-wave this year several such assemblages were observed near the river bank at Goring-on-Thames. At 10.45 a.m. a small crowd of butterflies was seen on a patch of dried cow-dung. At one time there were five male *Pieris rapae* and one male *P. napi* present; one *Aglais urticae* joined them for a minute. All were sucking hard at the dried surface of the dung. At 2.45 p.m. on the same day two male *Lycaenopsis argiolus* were seen sucking on a small piece of bird-dung. Another patch of dry horse-dung was also seen to be visited by two male *P. napi*, one male *P. rapae*, and three male *Polyommatus icarus*. No dung visitors were seen on any other day although the weather had been, and continued to be, very hot.

**Mimics and parasites of the Honey Bee in Africa.** By Prof. G. D. HALE CARPENTER.

I have received the following notes from Mr. T. W. Chorley, of the Agricultural Laboratory, Kampala, Uganda, who has recently become a Fellow.

The Syrphid (*Eristalis plumipes* Bezzi) can always be found hovering around bee-hives, and its presence indicates that a native hive or a nest of bees in a tree is near.

In the case of a European hive the fly settles on the alighting-board and is accepted by the bees; it can often be seen in the hive during manipulation.



The Italian bees from imported queens do not accept the Syrphid so readily as the native bees, but often sting them and take them outside the hive.

The flies are very active and cannot easily be caught away from the hive, but they can easily be caught on the alighting-board. On entering a hive their movements are rapid and they rush in in the same manner as a bee does.

Inside the hive they have been found trying to pass the queen excluder, and they emit squeaks resembling those made by a queen bee a short while before swarming. It is possible that they come to rob the hive either of pollen or honey as they have been observed with their heads inside the cells. When trapped, in a queen and drone trap, on attempting to leave the hive, their excreta closely resembles that of worker bees which have been feeding on honey, and it is also possible to note them voiding this excreta when hovering. From the similarity of this excreta to that of honey-feeding workers it is probable that the flies have been stealing the honey.

When a person approaches a hive of bees a number of these flies will fly at him emitting a buzz indistinguishable from that of angry bees. This is somewhat disconcerting especially as the African bee is distinctly vicious, and, without experience, it is difficult to know whether bees are attacking or merely harmless flies.

When handled the fly curves the abdomen downwards as if attempting to sting and sometimes buzzes on a note indistinguishable from that of a bee.

There is no indication that the Syrphids are parasitic, they appear to be just robbers, but the Tachinid *Rondanioestrus apivorus* Vill. is present as in South Africa (Brain, C. K., 1929, "Insect Pests and their control in South Africa," p. 397). In Uganda there are a few small points of difference in habit, the larva emerges from the anus of the bee and not from between the abdominal segments. The native bee does not die before the emergence of the parasite, as occurs in South Africa, but rushes madly about while the parasite is emerging and dies shortly afterwards. The fly will deposit live larvae in test tubes, and as many as 180 have been deposited by one fly.

A second parasite is a Conopid *Physocephala microvena* Brun. which attacks Italian bees but has rarely been found to attack the native bee (*A. m. andersoni* and *A. m. unicolor*). It has exterminated one hive of Italian bees. The parasitised bees are carried out of the hive and found dead on the ground. Bees collected in front of the hives are found to contain larvae or puparia according to the length of time they have been lying there. The spiracular processes of the larvae are elongated when they are full grown and the two protuberances are visible on the pupa projecting from the end of the bee's abdomen.

I have consulted the account given by Brain and think that a few remarks will be of interest to Fellows who might not be familiar with the book. The females haunt the hives and deposit young larvae upon the bees as they return to the hives: the larvae burrow through the intersegmental membranes and remain in the abdomen, never destroying alimentary canal or nervous system until the last. Parasitised bees die very suddenly (probably when the nervous system is attacked). The fly attacks bees indiscriminately so that the larvae deposited upon old bees will often not have time to mature, the young bees that play round the front of a hive during the mid-day spell are often attacked, and possibly it is only in these that the larvae

will reach maturity. Brain found that three per cent. of the incoming bees were parasitised.

Mr. Chorley's remarks upon the *Eristalis* pretending to sting remind me of my experiments with an *Eristalis* and a young monkey which, after some hesitation, took a live specimen in its hand, and suddenly released it or threw it down precisely as if it had stung him. On one occasion the fly was rubbed on the ground in the same way as the model (1921, *Trans. ent. Soc. Lond.*, 1921 : 100-12).

Exhibited with Mr. Chorley's specimens were *Eristalis* (*Lathyrophthalmus*) *melanops* Karsch, closely resembling honey-bees taken with them on flowers in the Sese Islands, L. Victoria, by Prof. Carpenter, in 1912. The identifications are by Miss Daphne Aubertin, M.Sc.

#### Interesting Butterflies from the Sudan-Congo border. By Prof. HALE CARPENTER.

Captain I. G. Owen, of the Sudan Defence Force, kindly brought to Oxford a large collection made by him at Bendere, in Bahr-el-Ghazal, on the Nile-Congo watershed on the border of the Sudan and the Congo, and quite near the boundary between the Belgian Congo and French Equatorial Africa. The strongly western affinities of the South Sudan are becoming more and more obvious, and the following specimens which were exhibited are among those captured by Capt. Owen from February to July in the present year.

*Papilio dardanus dardanus* Brown, ♀ form *niobe* Auriv. The very rich dark orange-brown of all the non-black areas agrees well with the dark orange of its model, *Planema tellus*, the western form *tellus* Auriv.

*Papilio cynorta*. A female, beautifully transitional from the black and white western form *cynorta* F. to the brown and cream Uganda form *peculiaris* Neave. The subapical patch on the fore-wing is very nearly white : the hind-marginal patch, of the size of that in the western race, is cream yellow, as is also the proximal part of the paler area of the hind-wing, forming a band continuous with that on the front wing. The greater part of the hind-wing, distal to the band, is brown, tending to black at the margin. A specimen almost the counterpart of this, in the Hope collections, was taken by Dr. S. A. Neave in Toro, Western Uganda, 7-9000 ft., Nov. 1912, another locality on the eastern fringe of the great western forest area. The appearance is like that of the transitional forms of *Planema epaea* mentioned below.

*Papilio carchedonius*, Karsch. A typically West African butterfly, and apparently rare.

*Papilio plagiatas* Auriv. Capt. Owen took a number of males and females of this little known species. The pattern of the male is like that of *cynorta* form *norcyta* Suff. in which the spot in area 6 of the fore-wing is absent. The ground-colour, however, is a purer black; the white, a purer white. The female has quite a different pattern from that of other members of this interesting group, it is black with a composite white patch in the centre of the fore-wing and another, nearer the base, in the hind-wing. In most examples the margins are unspotted, but a single specimen has prominent submarginal spots on the fore-wing in areas 1b, 2, 3, and 5, and an apical spot; on the hind-wing there are less conspicuous submarginal spots in areas 3, 4, 5, 6. The pattern is not suggestive of *Danaine* mimicry, which

is remarkable in this group, but has a certain resemblance to that of females of the Nymphaline genus *Cymothoe*, also figured by Aurivillius in *Rhopalocera Aethiopica* (cf. Taf. VI, fig. 8 with Taf. IV, fig. 4).

*Planema epaea*. Attention has previously been drawn to specimens transitional between western and eastern forms (1933, *Proc. R. ent. Soc. Lond.*, 8 : 109), and some of these were exhibited for comparison with the transitional *cynorta* mentioned above. The traditional association of forms of *Pseudacraea eurytus* is exemplified also in this area by pale specimens with the pattern of the form *terra* (mimicking *Planema tellus*) but with the pale areas not orange but yellowish or cream coloured as in the transitional *Planema epaea*. Other forms of the protean *Pseudacraea eurytus*, also from Bendere, are of the greatest interest. One, black and white, corresponds more or less with *fulvaria* Btlr. or perhaps is nearer to *tirikensis* Neave. The black and white pattern is typically western, but extends up to the Nile in Uganda. A second specimen is of the form recently named by Ungemach as *youbdonis*, which, as he points out (1932, *Mém. Soc. Sci. nat. Maroc*, 32 : 60) is probably a form of *striata* Btlr., a typically western form. The form *youbdonis* has all the lighter orange-brown concentrated into basal patches particularly large on the fore-wing, the distal parts of the wings being grey-brown. It was described from Abyssinia from a female, but there is a male in the National Collection from Isubu, W. Africa. A specimen which links *youbdonis* with the black and white form first named was taken also at Bendere. The fore-wing, of grey-black ground-colour is strongly tinted with red-brown over the posterior and proximal part : there is a white transverse sub-apical bar very slightly dusted with yellowish scales, not quite so wide as in the first specimen. The hind-wing is grey-black but very largely tinted with red-brown at the base, and with only a trace of white at the costal edge. The under surface of the hind-wing does not show the definite triangle typically exemplified in the first specimen but is nearer the condition of *striata*. It thus appears that *youbdonis* and *striata* are forms of *eurytus* : the whole question of the protean nature of this species requires further anatomical investigation. (See the earlier work by Jordan in 1911, 1<sup>er</sup> Congr. Int. Ent., Bruxelles, 1910, 2 : 385-404.)

The following species, not exhibited, also taken at or near Bendere, and of West African distribution, are worthy of record :—*Charaxes zelica* Btlr., *Cymothoe jodutta ehmkkei* Dew., *Mycalesis asochis congoensis* J. & T., and *Larinopoda lircaea* Hew.

*Aphnaeus asterius* Plötz has been taken by Captain Owen at Lotti, in the south-east corner of Sudan, Mongalla Province.

#### Further examples of attacks of birds upon butterflies. By Prof. HALE CARPENTER.

The following specimens show as clearly as possible, on both sides of the wing, the imprint of a beak.

1. *Acraea doubledayi sykesi* E. Sharpe, a male captured by Captain I. G. Owen at Torit, Mongalla Province, South Sudan, 22 October, 1933. The imprint commences at a break on the hind margin between veins 2-4 and runs near the margin to the costal angle. The extreme tip of the imprint is carried forward on to areas 1a, 1b of the fore-wing. The specimen is a very fresh one : the injury being unilateral may have been inflicted during flight.



2. *Pararge megera* L. [No data available.] A male found in a collection of British butterflies presented to the Hope Department by Mr. E. F. S. Tylecote. The right fore-wing bears on both surfaces an extremely clear imprint commencing at the apex and running backwards and inwards to vein 1 near the base, where there is a small round perforation. The base of the mark encloses the ocellus. The specimen is a very fresh one and otherwise uninjured. As in the previous case it was possibly attacked on the wing, and the freshness of condition suggests that the butterflies were attacked when they may just have begun to fly, and before full powers were attained. The perforation suggests a beak with hooked tip such as that of a Shrike. Comparison with the figure on 1932, *Proc.*, 7 : 11 is of interest.

The following specimens, also sent by Captain Owen who captured them, were exhibited for comparison. Each bears an ill-defined mark in the shape of a narrow triangle, on one or both fore-wings, directed from the outer margin at veins 3 and 4 across to the costa at the end of the cell, and plainly shown on the anterior surface of the costa. The similarity of appearance and situation, the absence of representation on the under surface, and the rather asymmetrical outline, sometimes slightly curved, of these marks indicated that they were due to the doubling over of the apex of the wing in the net, and were not beak-marks but fold-marks.

A somewhat similar condition in which the mark was much clearer, and more regular, was exemplified in a specimen of *Salamis cacta*, which had been exhibited to the Society on 2 May, 1934, and was discussed as an example of difficulty of interpretation. The very regular character of the mark and its absence from the under surface inclined one to believe that it may have been due to a bird biting on the wing resting outspread on a leaf, but the three obvious fold-marks now exhibited made it possible that in the case of the *Salamis cacta* also the mark was due to folding, but unusually regular and well defined.

The three specimens exhibited are *Euphaedra eleus* Drury, *Euphaedra medon* L., *Euryphene absolon entebbiae* Lathy.

**The means by which the resemblance of the British Capsid bug, *Pilophorus cinnamopterus* Kb., to the "Wood ant," *Formica rufa* Linn., is produced.** By Mrs. M. D. BRINDLEY.

[Communicated by Prof. POULTON, who exhibited the drawing and stated that Mr. W. E. China and Mr. Horace Donisthorpe entirely agreed with the conclusions of the authoress; also that the paper had been compiled from letters written by his friend.]

1934, Oct. 1.—I recently caught an uncommon little Capsid bug *Pilophorus cinnamopterus* which is extraordinarily ant-like. The resemblance is commented on by E. A. Butler in his "Biology of the Heteroptera," 1923. I find that the waist-like appearance is brought about, not as in *Nabis lativentris* Boh., by white lateral markings on each side of the abdomen but by delineation due to white pubescent streaks, and the illusion is carried out by the insect's behaviour. I think Butler is wrong in saying, on p. 470, that it resembles the wood ant in shape. Its shape is quite ordinarily Capsid-like, but it is masked by these white patches which give the idea of a petiolated abdomen like an ant's.

1934, Oct. 17.—I am sending a very rough water-colour sketch of the bug, a

rather rare little insect found on Conifers. I took a single example this summer near Thetford. In life it is remarkably like an ant, but the sketch does not show this sufficiently. I think the resemblance is due to the brown and chestnut coloration, the carriage of the head, and of the hind legs with their thickened femora, the deflected membrane of the hemielytra, the incrassated first and second antennal joints and the thin, almost invisible third and fourth joints which give the impression of the short dark hymenopterous antenna rather than of the longer and more slender heteropterous one. The transverse bands across the hemielytra are caused by long pale silvery pubescence, very beautiful under the microscope. There are three British species of the genus:—*cinnamopterus* Kb., on Conifers; *clavatus* Linn., and *perplexus* D. and S., on *Salix* and various other trees. All three are much alike to look at and all three are described by various authors here and on the Continent as accompanying ants, especially *Formica rufa*, but it seems most probable that the bugs suck the juices and also the honeydew of the Aphides in which the ants are also interested. What I am leading up to is that one could make out a good case for supposing that these Capsids were ant-mimics—not perfect yet, but mimics in the making with the raw material all there if the selection was strict enough to bring it out. Of course they must be a hundred times rarer than the ants they consort with. In all three, although it does not look like it in the sketch, you get the impression of the hymenopterous “waist,” though it is less strikingly represented than in the larva of *Nabis lativentris*, another bug ant-mimic in this country. The round abdomen is represented by the deflected posterior third of the hemielytra. The curve of the latter catches the light at the hinder margin of the corium. In *cinnamopterus* the cuneus is dark brown without any of the silver pubescence. In *clavatus*, of which however I have been able to examine only the one old faded example, there are a few traces of scattered pubescence on the cuneus but without any pattern. But in *perplexus* there is a neat round spot of pubescence on the cuneus just where the high light would fall if it was the upper part of the abdomen of an ant. As to the “waist,” in *cinnamopterus* the corium is the same colour throughout its width, but in *perplexus* the corium is divided obliquely across by the median vein, and the inner half (median half) is chestnut and the outer half darker and fuscous. This variation enhances the impression of a “waist.” But in the Museum here there is one *Pilophorus* which has the white pubescent patches on the cuneus as in *perplexus* and yet at the same time has the colour of the corium as in *cinnamopterus*. The latter is supposed to be one of the specific characters. These two species also differ from *clavatus* in the arrangement of the transverse silvery bands on the hemielytra. Thin bands run comparatively evenly across the hemielytra, but in *clavatus* that portion which lies on the clavus does not synchronise with that on the corium. Altogether, *perplexus* is the most finished product of the three, the “high light” on its cuneus being especially convincing. But, oh, how unlike the “set” insects are to the real thing in nature!

**Procryptic and mimetic resemblances in N.W. Himalayan insects observed by Col. H. D. Peile.** By Prof. E. B. POULTON.

The following interesting examples were extracted from his diary by Col. Peile.  
*Procryptic Resemblance of a Pentatomid larva to its food-plant.*—Col. Peile wrote, 20 Mar. 1933, concerning this larva, of which his coloured drawing was exhibited

to the meeting—"one of the most curious instances I came across was that of a larval form of Pentatomid bug which I took settled on a small shrub whose leaves were green and crimson like the insect. The legs were also green and pink. Curiously enough I never found another like it although it was probably not uncommon there (Mussoorie, N.W. Him.).

"My note at the time of capture runs :—

"Taken at Mussoorie 13 June, 1917 : rose-red and green, on small bush, whose leaves were green and red, in a wood. The legs are green and red. The whole insect is very flat, the main portion almost paper-like. The interesting point is that it was clinging to one of the stems of a small bush with small green and also red leaves."

Mr. W. E. China had written, 13 Nov. 1933 :—"The insect represented in Colonel Peile's letter is the larval form of one of the TESSARATOMINAE, family PENTATOMIDAE, and probably of the genus *Eusthenes*. It is impossible, of course, to give the species, although we have a larval specimen which agrees very well indeed with the figure; but there are many species of the genus *Eusthenes* distributed over southern Asia and these are separated on secondary sexual characters, so that it is impossible to identify a larva unless it has been reared to the adult stage. The red and green colour is the normal colouring of the larva of this type of bug. Whether they always settle on red and green leaves I do not know." Further observations on this subject would be of very great interest.

*Procryptic Resemblance of the moth Elphos pardicelata Walk. (Geometrinae) to rock surfaces.*—Col. Peile noted in his diary :—"♀ taken at Mussoorie in the Pumping Station nullah (5,600 ft.) about 10 a.m. It was settled on the face of a rock with wings out-spread, and so nearly resembling the surface that it was not noticed at first. June 23, 1914." The diary also records "a ♂ taken on bush 2 days later," and "a ♂ in good condition, 23 Sept. 1916," both at Mussoorie.

Col. Peile also remembers that, although he was "searching this spot for a small species of Skipper, yet this comparatively large moth remained for some minutes quite undetected."

*The Epicopiid moth Nossa (Atossa) nelsoni Moore, mimicking a Pierine butterfly.*—Col. Peile recorded in his diary :—"A fine specimen of this day-flying moth, taken 20.vi.1913, settled on a stone at side of gorge : Mussoorie, at 5,500 ft. It has an extraordinary resemblance to *Aporia agathon caphusa* [Moore], or (doubtfully) *Delias sanaca* [Moore], both found there (*caphusa* abundant). It settled, as if hiding away, in a hollow among stones by the nullah-bed, and not like *Aporia*." Comparing the specimens in the British Museum collection with the two Pierines, I was led to believe that, upon the wing, the moth would bear a considerable resemblance to both species.

In studying Col. Peile's notes on these Lepidoptera I received kind help from Mr. W. H. T. Tams and Mr. A. G. Gabriel.

#### Experiments with spiders and the bee-like *Eristalis tenax* Linn. By Dr. J. G. MYERS.\*

Prof. POULTON in communicating the paper said that his friend the author had written, 23 May, 1934 :—"I have always been greatly interested in the discrimina-

\* As Dr. Myers' interesting notes refer to the foes of British insects, it is appropriate to mention here, especially in relation to wasps as enemies of butterflies (1934, *Proc. ent. Soc. Lond.* 9: 66, 71-2), Dr. G. V. Bull's description of *Vanessa atalanta* Linn., twice vainly attacked (1927, *Entomologist*, 60: 7), and that of Mr. K. F. M. Murray, who observed an *atalanta* disabled and unable to fly after a wasp had seized it by the thorax (1926, *ibid.*, 59: 317).—E.B.P. 18 Feb., 1935.



tion shown by predators, and greatly under-estimated by the opponents of the mimicry hypothesis. I was led to make some experiments some years ago, with spiders and *Eristalis*, which you may think sufficiently interesting for the *Proceedings*. I am sending to you for help because I cannot look up the literature here, and am, therefore, unable to judge how far they are original."

Dr. Myers' results may be compared with the treatment of *Eristalis* by Vertebrate insect-eaters as recorded by Dr. F. E. Beddard,\* who found that it was "refused or tried and rejected by several [birds]. Eaten after careful pinching by others." Marmosets were "at first afraid, but afterwards ate many"; lizards of three species ate the insect "without hesitation." These statements are quoted from the table on p. 165, *loc. cit.* Prof. C. Lloyd Morgan † wrote:—"I have satisfied myself by experiments with young birds, that (1) after experience with bees, drones are avoided, and (2) that after similar experience drone-flies are also left untouched." Sir Guy Marshall's experiments with spiders ‡ in Natal were confined to Lepidopterous prey, as were those of Canon St. Aubyn Rogers || at Rabai, Kenya Colony, although on one occasion "a small bee got into the web and was released, great caution being exercised" (p. lxxv).

*Spiders and Eristalis.* By J. G. MYERS.

I do not remember that there is in the mimicry literature a clear statement as to the treatment of the bee-like species of *Eristalis* by spiders. On 18th September, 1926, at Ashen, Essex, I began a few experiments with full-grown females of *Epeira diadema*, but these were largely abortive owing to shortage of material. One spider, which had just successfully swathed a large and powerful moth, retreated with every sign of terror from a largish wasp-like Syrphid. Caged spiders of the same species dropped tumultuously from their webs or perches when a wasp was introduced. On the 28th more material was available—a number of hive-bees (*Apis mellifica*), wasps (*Vespa germanica*), and the Diptera *Pollenia rudis*, *Lucilia* sp., *Calliphora erythrocephala*, and both sexes of *Eristalis tenax*. Webs of full-grown *Epeira diadema* were plentiful in the hedges, and were experimented with *in situ*. In every case the Diptera, except *Eristalis*, and including *Calliphora*, practically the same size but with a much more vigorous buzz, were seized forthwith and immediately dealt a quietus with the Chelicerae. At the other extreme were the wasps, which sometimes caused the utmost manifestation of terror, as shown by instant retreat from the web. Other spiders would seize the web and jerk it vigorously in the direction of the wasp, bee or *Eristalis*, as though to shake it out. Others, or later perhaps the same spiders, would gingerly advance, usually in a very different manner from the impetuous dash upon a blowfly, drawing back suddenly with the fore-legs elevated—an "avoiding reaction"—when the prey made a sudden plunge or emitted an extra strong buzz. Often these tactics would last for so long that the prey succeeded in freeing itself. In some few cases the spider would more or less expeditiously rotate the prey, showing great skill and alacrity in avoiding both the mouth-parts and the apex of the abdomen, and swathe it in silk till complete helplessness permitted a bite

\* "Animal Coloration," Lond., 1892, pp. 153, 154, 165, 232.

† "Animal behaviour," Lond., 1900, p. 164.

‡ 1902, *Trans. ent. Soc. Lond.*, 1902: 319-325. Early experiments also with Lepidoptera are quoted on pp. 325-328.

|| 1916, *Proc. ent. Soc. Lond.*, 1916: lxxiv-lxxvi.

to be administered. This was usually inflicted near the middle of the dorsal surface—the safest position.

A few days later, with the same species of spider, the following results were obtained :—

Four very large blue-bottles seized and killed without preliminary caution or swathing.

One *Eristalis tenax* put in web of *Epeira* about as large as itself. Much plucking at the web, as though to release the fly. A very gingerly approach, the fly finally carefully swathed. Two more were treated similarly.

One very large blue-bottle put in web of *Epeira* only half its size. Seized at once *by end of abdomen* and held securely, though both wings were free from the web and vibrating powerfully.

One worker-bee was found in an *Epeira* web, alive but swathed.

One wasp (*Vespa germanica*) was finally swathed and then bitten on the dorsal surface near base of abdomen. Swathing was continued and the bite repeated in the same place.

A large *Epeira* was given an *Eristalis tenax*. After a few minutes' hesitation, tapping and springing back, it bit the fly on the head, before swathing.

One bee was gingerly approached and finally swathed.

One large bumble-bee was not tackled in any way.

Some days later another *Epeira*, a large yellow and black species, touched an *Eristalis tenax* gingerly, and finally swathed it with considerable circumspection.

The results may be summed up as follows :—

(1) *Calliphora* and other large Muscoids were treated with no circumspection, but tackled with a tumultuous rush. They were never swathed by full-grown *Epeira*.

(2) Hive-bees and *Eristalis*, if negotiated at all, were nearly always swathed. Both were sometimes shaken in an attempt to free the web of them. Both were treated with the same caution and sometimes allowed to escape.

(3) Wasps were tackled with the same circumspection as bees and *Eristalis*, but sometimes the extreme terror they inspired was sufficient to cause the spider to leave the web.

It would appear that the treatment meted out to a victim depends very little on its size and vigour (save in extreme cases like the bumble-bee), but almost entirely on its species, though the idiosyncrasy of the individual spider is a factor. *Eristalis tenax* was treated like a bee, and not like a fly of the same bulk.

#### **A Reduviid bug mimicking a Braconid, and an Asilid fly mimicking a bee, collected in British Guiana by Dr. J. G. Myers. By Prof. E. B. POULTON.**

The following note, dated 7 Aug., 1934, accompanied the specimens exhibited to the meeting, sent by my friend Dr. Myers :—" Under separate cover I am sending a fine mimicry pair. The Reduviid bug has been determined by Mr. W. E. China as *Hiraneis cingulatus* Stål; the Braconid has not been identified." The Reduviid, presenting a marvellously precise and detailed likeness to its model, bears the date " Mt. Roraima, 1932," the Bracon, " Kanuku Mts., Jan. 1934."

" The model of the Asilid fly—the bee *Euglossa fasciata* Lep., determined from a similar specimen by Dr. G. Salt, was captured at flowers of *Heliconia bihai*,

which it pollinates regularly. Wanaina, N.W. District, British Guiana, 9 March, 1931."

The beautiful mimic, *Mallophora fascipennis* Macq.,\* ♀ (ASILINAE), exhibited with its model, was taken in the same locality 14 March, 1931. Dr. Myers' note is as follows:—"What I thought was the *Heliconia Euglossa* flew by. When it alighted on a stump I saw it was an Asilid. In flight it is exceedingly like the big *Euglossa*."

**An aboriginal folk-tale based on the bird and wasp nesting association.** By Dr. J. G. MYERS.

Communicated by Prof. E. B. POULTON, to whom Dr. Myers had written 19 Oct., 1934:—

"I recently found a remarkably charming collection of mixed Red-Indian-Negro folk tales by a Miss Owen. They were gathered in Missouri, where the aboriginal element apparently predominated, as certainly in the tale I enclose herewith, which was communicated by an old French-Indian (Iowa tribe) half-breed. I know nothing similar in South American folk-lore, but then I have very little literature here, and my wife, who would know, is in British Guiana, in the interior. There is nothing like it in Koch-Grünberg's fine collection."

1893. Owen, Maria Alicia. "Old Rabbit, the Voodoo, and Other Sorcerers." London, xv + 310 pp., illus. pp. 36-37.

"When the big black witch from Thunderland came sweeping over hill and hollow to fight the witch of the bright Corn Country, the world rang with the sound of her terrible voice and the trees bowed themselves to the ground in terror. In her anger she danced, she whirled, she whistled. She smote the trees, she trampled the prairie-flowers, she scattered the corn-in-the-ear as if it had been blades of grass plucked by a child. She fought the witch of the Corn Country, striking her fiercely. She would have prevailed and destroyed the witch and her country utterly had not a wasp, flung from his nest hung from the bough of an ancient crab-apple tree, stung her in the eye, so that her tears fell, and then she became calm and weak as the weakest of old women. Then it was that the witch of the bright Corn Country was able to chase her back to her own land.

"Now the witch of the Corn Country was not forgetful, nor ungrateful. She took her benefactor, the wasp, in her hand and besought him to ask for whatsoever he desired, promising, at the same time, that it should be granted him. Immediately he answered that he and his wife wished, exceedingly, not to be wasps, whom every one hated, but birds, well-beloved by all.

"At once the wasp and his wife had their wish and became orioles; but, because some of the wasp nature was left in them, they did not build their nests as other birds do, but made grey pockets to hold their eggs, which from afar looked like wasps' nests; and as they did, so do their children to this day."

Prof. Poulton said that the "black witch" was apparently a personification of the destructive storms sweeping down from the mountains. He did not know how far north the nesting associations had been traced, but folk-tales wander and

\* This species is considered to be the same as *tibialis* Macq. by Kertész (1909, *Catalogus Dipteriorum*, 4: 250, Budapesth), but Dr. B. M. Hobby is convinced that they are distinct.



there was no improbability in the combination of northern and southern elements in the same story.

The "Viceroy" (*Basilarchia archippus* Cram.) mistaken for its model the "Monarch" (*Danaus plexippus* Linn.). By Prof. R. A. FISHER, F.R.S.

[Communicated by Prof. POULTON, who explained that this interesting involuntary evidence of the deceptive resemblance between model and mimic was quoted from a letter written by his friend Prof. Fisher on 2 Nov., 1931.]

"While I was in the States this summer I had rather numerous opportunities of seeing among Geneticists and other Biologists the beginning of a new interest in selection theory, though the amount of harm the early Geneticists have done is certainly enormous. While out there I took to collecting butterflies, partly as a good excuse for being on my own feet, instead of in someone else's car, and one experience may interest you, as we sometimes still meet with Entomologists who pooh-pooh mimetic resemblances by saying that any tolerably observant creature could tell mimic from model at a glance. Of course such an objection only applies to Batesian mimicry, though this is not usually recognised by the critic. I was very anxious to catch the big 'Monarch' and its smaller mimic the 'Viceroy,' but they only came late in the season, and it was some time before I saw any. The first one I caught was a 'Viceroy' which I duly pinned out, and then asked an Entomologist, who was working in the Laboratory where they had very kindly given me bench-room, which of the two it was. His speciality was grasshoppers, and he unhesitatingly declared it to be a 'Monarch,' and when I remarked that it didn't seem big enough, explained that the size was variable according to the nutritional conditions enjoyed by the larva. Of course when I had caught a few more the mistake was obvious, and we both of us could see numerous differences by which we could have identified the first specimen. However, it was very striking that a mistake should have been made under ideal conditions of observation, on a pinned-out specimen, by a man who must have been quite practised in seeing detailed differences, merely because he had never paid particular attention to that particular distinction. Those who adduce this particular criticism seem to expect a lot of their birds."

Some details concerning the Brassolid butterfly, *Dynastor macrosiris*, its early stages, life-history and food-plants. By Rev. A. MILES MOSS.

Of this butterfly, which is a rarity, or still a deficiency, in the great collections of the world, I have a short series of bred specimens. Its larva is obtained on at least three out of a number of arboreal Bromelias.

In accordance with the locality of these plants, growing at all elevations on various trees, nearly always standing in water and invariably above flood-level, the butterfly, in these parts at least, may fairly be regarded as an aquatic species. A subspecific form, or more likely a distinct species, has also been taken at 7000 feet in the mountains between Ecuador and Colombia.

Since these plants are widespread and abundant in similar watery districts, and many of them bear traces of having supported this particular larva during the

previous year or two, I am convinced that the species itself is also widespread, and is actually by no means so rare as it is supposed to be.

Though liable to the attack of at least two hymenopterous parasites in the egg and caterpillar stages, only a few isolated examples of these were noted, and not one of the dipterous parasite which so frequently attacks *D. darius* and *Caligo* sp., laying a cluster of white eggs on the narrow necks of the larvae immediately behind their hard, horned heads.

*D. darius* can support the loss of thousands of specimens in this way, for it obviously has a succession of broods, and there is perhaps no month in the year when its larva cannot be taken on the blades of our common pineapples in garden or field. With *macrosiris*, however, the case is different, and, after much exploration, I can only conclude that it has but one brood, or possibly two, during the first six months of the year, during the flood-season. In support of this argument, I am able to make the following statements:—

(1) The larval period covers not less than 60 days, while conversely the pupal period is remarkably short, all my 7 butterflies bred from the larvae, whose changes I had carefully noted, emerging in less than 18 days, the second male taking 15 days, 17 hours. They generally emerged by 7 in the morning, the latest emergence taking place at midday. Though “working” with a quiet rocking motion for about an hour subsequently, the actual wing-expansion, as with all such species, is marvelously rapid; they literally leap out to their full tether in much less than 5 minutes. Here on their empty shells they invariably remain suspended till about 5 p.m., at which hour, or a little before it, I had to consign them to the lethal chamber, anxious lest they should batter their lovely blue-black wings, for the slightest touch leaves its mark.

(2) Subsequent examination of their abdomens revealed the fact that in nature, and under ideal conditions, both sexes were destined for an unusually prolonged butterfly existence; that of the male being inordinately large and heavy, and containing much fatty matter, while the ovary of the female was similarly embedded in fat, completely immature, with but 2 or 3 large-sized yellow eggs, so soft that they collapsed to liquid in the attempt to remove them.

If I am correct in my surmise, two interesting questions naturally follow: (1) After what interval of time are copulation and oviposition likely to take place? The large amount of stored fat in both sexes probably makes feeding, in the ordinary way, of secondary importance. (2) Where do these butterflies live during the remaining 6 months of the year? During the great number of hours when they are not on the wing, and are never found at rest in the open, I can only suggest that both sexes adopt a hermit-like existence in the innumerable holes and hollows which characterise so many of the gnarled tree-trunks of the *igapó*. If so, they must certainly enjoy an extraordinary immunity from the attacks of bats and lizards, which haunt such quarters in great numbers, not to mention the birds and a host of other foes. Focussing to a point what we know about *macrosiris* and its habits, I emphasise the word when I say that *apparently* the male is somewhat unaccountably rarer than the female. This is not only supported by the scarcity of this sex in collections, but also, I think, by the numerical preponderance of large-sized pupae among the hundred odd remnants that I encountered in my searching. Fruhstorfer, in *Seitz* says “only a few examples are known, mostly of only one sex”;

and further, referring to the three names of *strix*, *hannibal* and *pharnaces*, assuming them to be sub-species, he says, "Of *strix* only females are yet known"; while of the last-named, mountain, form one male only had at the time of writing been taken, in Bolivia, at an elevation of 2000 m.

Of my larvae the first 4 produced grand big females. This was expected as there is usually a marked disparity between the sexes in the matter of size. The smaller dimensions of my remaining larvae led me to anticipate males, but, to my disappointment, only 2 of the 9 pupae produced adults of this sex.

It is apparent that both sexes are so lethargic and secretive that, allowing for their strange watery locality and their even stranger limitations in the matter of movement, it is perhaps small wonder that they are so seldom seen and caught, and are consequently accounted rare. I refer to their time of flight, presumably the same as that of *darius*, which synchronises with the exit of the bats at sunset and their return, roughly between the hours of 5 and 6.30 both morning and evening in equatorial regions.

Most other dusk-loving butterflies of this group, like *Opsiphanes*, *Eryphanis* and *Caligo* spp., are very frequently drawn from their shady haunts even during the hot and sunny hours of the day by banana-bait. Never, in my experience, is this the case with the species of *Dynastor*, which adopt the life habits of that most moth-like of all true butterflies, the superabundantly common *Brassolis sophorae*. The gregarious larvae of this species spoil our avenues of Royal Palms by reducing half their noble fronds to skeletons; and yet their dull brown butterflies are but seldom seen, for they do not fly by day, and appear to feed only as caterpillars, for they never come to fruit. After flying about the tops of palms and bananas in the dusk for half an hour until it is nearly dark, they are occasionally attracted by the street-lamp, or are drawn into houses when the lights are turned on. On parallel lines, therefore, I think I now have sufficient grounds for inferring that the three known species of *Dynastor* have no appetite for sweets, alcohol or decaying matter; are never seen flying by day, and are so securely hidden away that they are very seldom disturbed by man or beast during their diurnal rest.

*D. macrosiris*, though less in expanse of wing than some of the great *Caligos* and *Morphos*, is, from its exceptionally weighty abdomen already mentioned, certainly one of the heaviest of butterflies in the American continent. The *Bromelia* plants are very unpleasant things to touch, for they cling to one's garments and their spines quickly draw blood. It is little short of marvellous that these large, smooth-skinned caterpillars can live in such an environment without getting spiked. At first I supposed that they simply bit off the thorns and let them drop, but on careful examination of the excreta, each pellet readily divided up into some 50 large scraps, green as the leaf just eaten, and I have several times detected at least half a dozen pieces of bitten thorn, even to the point, which had passed through the alimentary canal of the caterpillar.

My first larva, found on April 18th, though externally full-grown was not quite full-fed, so next day I was able to watch it consume two or three inches of fibrous blade, thick as stout leather; and it was an education to see it pare down the leaf on each side, and then leave it with a neat point scarce inferior to its original, as though not to draw attention to its ravages. Though sometimes more careless in satisfying the pangs of hunger the usual method of feeding is identical with that of



*darius* on pineapple blades. While feeding, and especially when preparing to moult, it sheds its pellets of excreta with extraordinary rapidity, for I counted no less than 10 in the space of an hour. These are so loosely held together that, rolling down towards the heart of the plant, they soon congregate in a thick mass, like so much coarse green sawdust, providing a ready clue to the whereabouts of a larva, or at least to its recent activities. After a time it lay still, giving me every facility for making accurate measurements and painting its picture in water-colours.

I found it to be exactly  $12\frac{1}{2}$  cm. measured when at rest from its face to the strongly hooked, upturned and bone-like pair of tails. Tapering at the extremities to 1 cm., its elegantly curved body swelled to just half as much again in diameter at the centre. Its dark head was furnished with the customary 8 knobbed horns, but each knob possessed an extra tiny lobe like a glossy cream-coloured egg, a most unusual feature. Though placed symmetrically, one at the tip of each knob facing back over the neck, they at once recalled the white eggs which the dipterous parasite so often lays behind the head of *darius*. As I subsequently found this to be a constant feature with all my larvae, even occurring in the second instar, I began to wonder what purpose these seemingly superfluous ornaments could serve in the economy of nature. I am now of opinion that they are definitely intended to simulate parasitic eggs, and thus discourage any fly from laying its eggs; for here was a larva already "stung," and it would be a waste of energy to lay more eggs and thus seal the doom of her progeny!

The face of the larva, very different from that of *darius*, was covered with short brown plush-like hair, relieved by cross lines in a lighter hue, which by suggesting elevated eyebrows and a drooping moustache above the mouth produced a good likeness to the head of a monkey in miniature.

The general ground-colour of the body was a warm apple-green, but the most striking feature was a series of 7 groups of 20 dark fleshy spines, regularly short or tall according to the position, arranged at intervals along the medio-dorsal line, and set, save for the first and last pair, in three broad and irregular ovals of a beautiful deep but suffused maroon tint. These spines, though soft and bending to the touch, exactly simulated the curving hard black spines which edged the blades of its food-plant.

On April 21st it became considerably reduced in length and thickness, and losing all its green it assumed a semitransparent ochreous hue, with the maroon changed into tones of sepia brown.

I always kept an entire plant suspended by a string from the roof, where it could be watered, and the larvae were reared without any trouble. This specimen now clung to the exterior of a yellowing basal leaf and spun a stout cremaster hillock of silk. From this it hung limply for a period, and then moulted on the 23rd to a very large and bulky chrysalis, which clearly predicted that the butterfly would be a female. On hardening, the pupa became bone-coloured on the wing-front, and was graded down the dorsal area with fine mauve lines gradually deepening to pure sepia on the lateral area of the wings. Bearing a strong resemblance to certain snail-shells often found on trees, it clearly afforded a new and striking example of protective mimicry.

Hardly had I finished my painting when my kind host brought me in a second and smaller larva, which he had found on a narrow-bladed *Bromelia* up the lagoon.

It was in its 4th instar in all essentials like the adult but of a bluer green and perfectly matched to the colour of the leaf. I afterwards discovered larvae in the 2nd and 3rd instars, which differed only in the matter of size and in the lighter colour of the central groups of spines. Subsequently I took a single very large globular egg, which had once been green, and was laid upon the upperside of a broad Bromelia leaf near the tip. It had obviously been parasitised for its contents had disappeared through a single small hole.

The larva I had painted, after barely 18 days in the pupa, produced a fat-bodied female on the day after I reached Pará, May 10th, which merits a description.

With a black costa to the fore-wing, strongly freckled with ochre, imperceptibly developing into an apical margin of whitish blue, and a single bifurcated white spot near the apex, the main area of the upper surface is an unblemished robe of rich blue-black with a broad suffusion of delicate ash-blue on all the fringed margins. The hairy region of the wings together with the lower thorax and abdomen are dead black, while the head and upper thorax on both sides are relieved by warm brown touched with light ochre.

On the reverse side the whole broad apical area of the fore-wing, marked off obliquely by a narrow, waved, white band, is of a smoky mauve suffusing into ash-blue and olive green, mysteriously touched with white and yellow, and exhibiting an apical spot or two and an adjacent pair of ocelli, all of an intense black set in cadmium. An irrorated "lozenge" of brown runs nearly parallel to the inner margin of the hind-wing, while two obsolete and very minute ocelli, widely apart, are more or less centrally situated.

The remaining area below recalls the fine striation of feathers on the breast of a game bird, being marked by innumerable short wavy black lines on an opalescent ground, altogether a most striking combination in colour and of unique design. The chief difference in the male, besides being smaller and sharper in cut of wing, is that the band separating the apical area is here marked also on the upper surface as a narrow, waved and interrupted belt of suffused cream-coloured scales. It is also blacker above and the opalescence more ruddy on the under surface.

At the request of the Rev. A. Miles Moss, specimens of the various species of *Dynastor* were exhibited by Dr. Karl Jordan, F.R.S., who gave a short survey of the classification of the species as follows :

The genus *Dynastor* Westw. 1851, consists of two sections :—

- (1) Hind-marginal area of smooth, pointed, modified scales on underside of fore-wing extends to cell and lower median branch.—Here belongs *D. darius* Fabr. 1775, the commonest species of the genus; distributed from S.E. Brazil, Paraguay and Bolivia northward to Guatemala.
- (2) Hind-marginal area of modified scales on underside of fore-wing extends only to submedian vein.—Here belong three species, which evidently replace each other geographically and are very similar in structure, but differ much in colour :
  - (a) *D. strix* Bates 1862, occurring in the Andesian countries from Bolivia to Mexico and Venezuela; fore-wing with broad white oblique band.
  - (b) *D. macrosiris* Doubl. Westw. & Hew. 1851, known from French Guiana and the Amazons; upperside almost uniformly blue-black, with or without a narrow, curved, oblique white band.

- (c) *D. napoleon* Doubl. Westw. & Hew. 1851, found only in the State of Rio de Janeiro at higher altitudes; fore-wing with oblique band, hind-wing broadly margined with orange.

### Papers.

The following papers were read :—

“ The genital sterna of the immature stages of *Rhodnius prolixus* (Hem.), ” by J. D. GILLET.

“ On the brush organs of the male *Lithosia griseola*, Hb., ” by H. ELTRINGHAM.

“ Nesting associations of birds with social insects, ” by J. G. MYERS.

“ High Mountain Sawflies of Britain, ” by R. B. BENSON.

“ The early stages of *Minoa murinata*, Scop., with a description of the verrucae of the larva, ” by E. A. COCKAYNE.

“ A revision of the African Telenominae, ” by G. E. J. NIXON (communicated by N. D. RILEY).

### Wednesday, 21st November, 1934.

Dr. S. A. NEAVE, O.B.E., President, in the Chair.

### Election of Fellows.

The following were elected Fellows of the Society :—H. ABDUL HAFIZ, B.A., Imperial College of Science & Technology, South Kensington, S.W.7; HOWARD E. HINTON, B.Sc., Zoological Laboratory, the Museums, Cambridge.

### Obituary.

The death of Mr. S. T. KLEIN, elected a Fellow in 1887, was announced.

### Nominations.

The SECRETARY read the following list of Fellows nominated by the Council for the ensuing year :—

*For President* : S. A. NEAVE, O.B.E., M.A., D.Sc.

*For Treasurer* : FRANCIS HEMMING, C.B.E.

*For Secretary* : A. W. McKENNY-HUGHES, D.I.C.

For other members of Council :—Professor W. A. F. BALFOUR-BROWNE, M.A., F.R.S.E., Professor P. A. BUXTON, M.A., Professor G. D. HALE CARPENTER, M.B.E., D.M., C. L. COLLENETTE, H. ELTRINGHAM, M.A., D.Sc., F.R.S., Brigadier W. H. EVANS, C.S.I., C.I.E., D.S.O., G. FOX-WILSON, A. D. IMMS, Sc.D., M.A., F.R.S., K. JORDAN, Ph.D., F.R.S., R. STEWART MACDOUGALL, M.A., LL.D., D.Sc., F.R.S.E., N. D. RILEY, J. A. SIMES, O.B.E., W. H. THORPE, M.A., Ph.D., C. B. WILLIAMS, M.A., Sc.D.



*Exhibits.*

The following communications were then made to the meeting :—

**Some butterflies taken in France in June and July 1934.** By Rev. E. B. ASHBY.

I took the following species at Contrexéville, Dépt. Vosges. *Apatura ilia* [Schiff.] var. *clytie* Hbn., and *A. iris* (Linn.) ab. *iola* [Schiff.], *Euphydryas maturna* (Linn.), *Coenonympha hero* (Linn.), and *Maniola jurtina* (Linn.).

**High-mountain Sawflies of Britain.** By ROBERT B. BENSON.

Eighteen species of sawflies are at present known to inhabit the arctic-alpine botanical regions of the high-mountains in the British Isles; thirteen of these are new to Morice's \* lists of British Sawflies, and four are entirely new species.

Much work has been done during three recent trips to the Highlands of Scotland by a party from the British Museum, when over 7000 specimens, mostly Diptera and Hymenoptera were collected, including over 50 additions to the British fauna and at least 13 new to science. Little is yet known of the native fauna of the mountain tops, but what is, is entirely arctic in nature.

**A Mantis preying on a Sphingid.** By Prof. G. D. HALE CARPENTER.

Miss Vinall has presented to the Oxford University Museum a mantis which Mr. Uvarov has identified as *Polyspilota aeruginosa* Goeze. It was captured in the Haut Congo at Bongandanga, 30 May, 1933, preying on a specimen of the Sphingid *Temnora f. fumosa* Walk. The head of the moth is missing and has presumably been bitten off. The record should be compared with that communicated by Dr. E. A. Cockayne in 1932, *Proc.* 7 : 22.

**A migrating Hesperid.** By Prof. HALE CARPENTER.

Miss Vinall has also presented four specimens of *Rhopalocamptia libeon unicolor* Mab., from Bongandanga with the following note. "These appeared in great numbers on 4 February, 1934, and stayed until the 20th. The pots of ferns and boxes of flowers on my verandah were covered thick with them. I could not tell from whence they came or whither they went." The records of migrating *Rhopalocamptia* being few the above is an interesting addition. Dr. C. B. Williams in his book ("Migration of Butterflies," 1930) only gives one record for *R. forestan* Cr. and one for *R. unicolor*.

**Emergence from the egg of the larva of *Charaxes pelias saturnus* Butl. Recent captures of interesting S. African *Charaxes* and of female butterflies after heavy rain.** By H. C. KENWAY.

[Communicated by Prof. POULTON, who exhibited the enlarged photographs of the egg and emerging *saturnus* larva.]

179 Brooks St., Brooklyn, Pretoria.

1934, Oct. 23.—At the beginning of August after a very dry autumn and winter we had 1.83 inches of rain—a most unusual fall for August. This was followed

\* "Help-Notes towards the Determination of British Tenthredinidae." 1903-1916, *Ent. Mon. Mag.*, 39-52.

by a very hot spell, the result being an extraordinary burst of *Acraeas*, *Lycaenids* and *Hesperids*. The most interesting feature was the preponderance of ♀♀. After fruitlessly seeking *A. hutchinsonii* Trim., ♀, for four years, I took five in an hour. *Ch. jahlusa* Trim., ♀♀, are also numerous and both sexes unusually abundant.

On Sept. 8th at 11 a.m. a *Ch. saturnus* laid an egg on a *Schotia* bush just outside my daughter's bedroom window. Platt has recorded *Schotia* as a food-plant in Natal, but I do not know of the tree existing in a wild state within 200 miles of Pretoria. Further, I believe there are only two in cultivation in this part of Pretoria.

The larva emerged on Sunday, Sept. 16th at 4.45. I had asked a Johannesburg friend to photograph the egg, and by a marvellous stroke of luck the camera was actually in position when the emergence occurred. I had just gone to the verandah to welcome some friends when I was recalled by a shout of "He's coming out." The larva had eaten a circular slot and the top of the egg was standing up with the head of the larva clearly visible. He bit the piece off and it fell to the ground. The enclosed enlargements give the whole story. He ate the eggshell down to the leaf before 5.30. Unfortunately, the wind was very strong and the negatives are not as good as they might be but they are, none the less, vastly interesting. What colossal luck it was that he should have chosen that moment to emerge. I netted the branch he was on, but he vanished 15 days after emergence, having just started his third instar.

Another event was the capture, this month, of a freak *Ch. p. saturnus*, ab. *laticinctus* Butl.,—a male with the upperside light areas pale yellow and the dark areas a very pale yellowish-brown. All the paler areas are abnormally large. The underside is normal. It is newly hatched and perfect and is the most extraordinary thing I ever saw in my life. Incredible as it may seem, there was another as white as *brutus* Cram. for which I at first mistook it, but afterwards saw it perch on a rock and show its underside, which appeared quite normal. The two were fighting with a normal male. I spent nearly two hours trying to take the others, but it was blowing half-a-gale and they were very shy and nervous, finally going away down the mountain.

I have just received news of the capture of *Ch. bohemani* Feld., ♂, ten miles north of Louis Trichardt (Northern Transvaal)—a new locality.

Prof. Poulton said that he had been struck by the prevalence of female Lepidoptera in nocturnal flights after rain, during a short stay in Bombay Harbour, 12–15 Sept., 1914. The Lepidoptera "included the females of certain butterflies [NYMPHALINAE] which flew at night and came to light with the moths." The moths taken at light, 1907–9, in Somaliland, by the late Mr. Walter Feather also included a remarkable preponderance of females, as was specially noted by Mr. L. B. Prout in his introduction to the GEOMETRIDAE.\* Prof. Poulton had always hoped to be able to correlate the sexes of Mr. Feather's captures with the rain recorded in this paper, and he still hoped that some naturalist would find time to do this work.

\* *Proc. zool. Soc. Lond.*, 1916 : 91–182, pls. I, II. For Mr. Prout's note see p. 142; also p. 93 for a reference to the Bombay females (where the year is unfortunately printed 1915), and pp. 94–101 for the Somali rain, recorded during the period over which Mr. Feather collected. This paper is also included as No. 12 in *Hope Reports*, 1913–1922, 10.

**Notes on Dorset Lepidoptera in 1934 ; abnormal epigamic behaviour of a male *Aglais urticae* L.** By H. L. ANDREWES.

[Communicated by Prof. POULTON, who said that the notes were extracts from a letter written by his friend at Bere Regis, Wareham. It was of much interest to hear of results presumably due to the two wonderful summers of 1933 and 1934.]

1934, *July 9.*—What an astonishing season it is for Lepidoptera ; I have never known them so abundant. Micros fly off every little branch one shakes, and the country seems alive with butterflies. I had two pleasant surprises yesterday. In passing through the narrow copse which runs close by my bungalow I saw an *L. sybilla* [*camilla* L.]. I had released a tattered ♂ two or three days previously, but was rather surprised to find it, as I supposed, still about. To make sure I followed the one ride that runs through the copse and soon saw another and subsequently quite a lot. They have certainly established themselves, probably through a stray ♀ last year. My back window (that of my living room) looks on the very part of the copse in which I saw the first, and they could not possibly have escaped notice for 6 years, for I am constantly poking about there ; also they are now conspicuous in the adjoining lane. It is jolly to have this lovely thing at my very door. Immediately after this I took a *c-album* L., and then four more ; this also is new to my immediate locality. *Paphia* L., too is here, though I think I have noticed one or two before.

Another thing that is about in remarkable numbers is *C. dominula* L. ; I have found it fairly common before, but this year it is swarming—it gives quite a tropical touch to the district ! One habit that I have not noticed before is that of flying, in the late afternoon and until sunset, round the tops of the oaks, descending lower at times, after the manner of *B. parthenias* L. Several may be seen at a time apparently aimlessly going here and there. But the thing I am really writing about is the following : I was returning in my car from Parkstone on July 6th and stopped at 7.30 p.m. (S.T.) by a little bridge over an affluent of the R. Piddle to see if *dominula* had emerged in the little marshy triangle by the bridge, where its larvae are always plentiful. I leant over the parapet of the bridge and saw one on the wing at once, but the astonishing part of it was that it was being vigorously pursued by a *V. urticae* ! I watched for some time and then the moth settled on some sedge a few yards from me with the butterfly, its wings outspread, apparently sitting right on top of it. I speedily approached, but before I could see what was happening off they went again, eventually settling once more out of sight on the other side of a broad ditch. I noted the spot as well as I could and made a *détour* to get to it, but unfortunately failed to see them again. The performance had lasted for quite three minutes and at no time were the two more than 3 or 4 inches from each other. The *urticae* was simply buzzing round the erratically flying moth all the time. Of course I had no net or I might have captured them and determined the sexes. Altogether it was a most remarkable sight, the outstanding feature being the extreme eagerness of the butterfly.

Prof. Poulton said that it was extremely interesting that the abnormal epigamic behaviour described by Mr. Andrewes should have been displayed by the same species as that observed by Mr. O. H. Latter on 6 June, 1928, and recorded in our



1929 *Proceedings* (4 : 70). In this instance the male *urticae* was eagerly pursuing a male *A. (B.) euphrosyne* L. Mr. Andrewes' description suggests that the male was acting as he does when obeying his normal instincts and settles behind the female with his head so near to her hind-wings that he can drum upon them with the antennal knobs. (See 1930, *Proc. ent. Soc. Lond.*, 5 : 99-101, with references.)

**Two rare insects from Wicken Fen.** By H. St. J. K. DONISTHORPE.

In September I took a specimen of *Psectra diptera* Burm. (Neuropt. HEMEROBIIDAE) in cut sedge. Although widely distributed in the Old World, from Siberia, through Scandinavia, to the British Isles and south to Italy, it is extremely rare and only 4 specimens have been previously recorded from Britain. A remarkable feature of the genus is the extraordinary dimorphism in the development of the wings—there being two forms, one with fully developed wings and one with the hind-wings very rudimentary. I am indebted to Mr. D. E. Kimmins for the identification of this insect.

I have also taken 3 specimens of the Capsid *Cyrtorrhinus geminus* Flor. in September at the same locality. Only a few specimens have been taken previously in this country until last year (1933), when it was taken in some numbers in Staffordshire. I am indebted to Mr. W. E. China for the identification of this species.

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### Wednesday, 5th December, 1934.

Dr. S. A. NEAVE, O.B.E., President, in the Chair.

The SECRETARY read for the second time the nominations of the Council for Officers and Council for 1935.

#### *Election of Fellows.*

The following were elected Fellows of the Society:—WALTER WILLIAM BAUM, Hazelhurst, 68, Hillmorton Road, Rugby; ANDREW G. HAMILTON, Imperial Institute of Entomology, British Museum (Natural History), Cromwell Road, S.W.7.

#### *Obituary.*

The death of Mr. G. C. LEMAN, elected a Fellow of the Society in 1920, and of Major H. C. JEDDERE-FISHER, elected a Fellow in 1928, was announced.

#### *Exhibits.*

The following communications were made to the meeting:—

**A new host record for *Phryxe vulgaris* Fall.** By A. W. MCKENNY HUGHES.

I have not traced a record of *Phryxe vulgaris* Fall., as a parasite of *Borkhausenia pseudopretella* Stn. and wish therefore to record it as having been bred from a larva of this common moth.

**The first recorded capture of *Argynnis maia* (Cramer) in England.** By E. B. FORD.

Mr. A. W. Bennett captured a specimen of *Argynnis maia* (*pandora*) between 3-9 August, 1911, near Tintagel, Cornwall, in a valley called St. Knighton's

Kieve. It was flying with several others over a large patch of purple loose-strife, and Mr. Bennett, realising that it differed from *A. paphia*, managed to secure it with his cap. He then pinched it, and set it with an ordinary pin on a flat piece of wood. On comparing the specimen with examples of the latter species in the British collection which he had formed many years previously, it was at once evident that it differed considerably from them.

Thinking that it was of some interest, Mr. Bennett sent the specimen to a well-known Entomologist who had published a work on British butterflies and moths several years previously. He supplied him with the details of its capture, and asked him if he would kindly give him some information about it. The gentleman in question did not see fit to reply to Mr. Bennett, but sent back the specimen, writing on the brown-paper wrapper the words, "*Argynnis paphia*." On its return, one of its antennae was found to be missing.

A few years later I identified the insect from a book on European butterflies, but after his previous experience, Mr. Bennett did not feel inclined to go further with the matter. The specimen has remained in his cabinet since his death some years ago. It was shown to the meeting with a photograph, taken at the time, showing the spot where it was captured.

**Habits of *Gonteosphodrus bicolor* Chees., a Reduviid from Papua.** By L. EVELYN CHEESMAN.

The chief food of these bugs in the adult stage is bees and wasps, and they are usually found on plants or blossoms. Any vibration causes them to throw up the fore legs above the head, in which position they wait for victims: small insects are merely stabbed with the proboscis, but the fore-legs are used to strike down and hold on the ground larger bees and wasps. The thorax and legs have long, stiff hair, which is covered with a viscid fluid. From dissections of the legs made by Dr. Eltringham it is proved that there is a secreting hypoderm underneath the cuticle.

**Tabanidae near Durazzo, Albania.** By D. J. LEWIS.

I wish to record the almost complete disappearance of Tabanid flies from the neighbourhood of the Durazzo Lagoon in Albania as a result of malaria control by measures against mosquitoes. The lagoon is a sheet of brackish water about four miles long, with extensive reed beds, and in July 1932 horse flies were abundant on the shore, biting men and cattle. Egg batches were numerous on the reeds. Only three species, *Tabanus solstitialis* Schin., *T. acuminatus* L., and *Chrysops italicus* Mg., were found although fourteen species were collected altogether in Albania. The lagoon was a breeding place of vast numbers of the malaria-carrying mosquito, *Anopheles elutus*, which have been controlled by the use of automatic tide gates which introduced sea water into the lagoon and raised its salinity. During a visit in July 1934 lasting four hours I noticed only one Tabanid in spite of the presence of cattle.

**The Swarming Habits of some West African Diptera.** By D. J. LEWIS.

*Note*: The Milichiid fly whose swarming habits at Gadau, Nigeria, I described in 1934, *Proc. R. ent. Soc. Lond.*, 9: 4, has been named *Pareccoptoma nigeriae*

Duda. The climatic conditions at Gadau at the time are described by Prof. P. A. Buxton and D. J. Lewis in 1934, *Phil. Trans. Roy. Soc.*, **224** : 175-240.

**Assemblages of Coccinellid beetles ; also of the Danaid butterfly *Danaus plexippus* Linn., during hibernation or migration. By Prof. E. B. POULTON.**

Miss F. J. Kirk's description \* of *Coccinella bipunctata* L. assembling in her house, 52 Oakhill Road, Putney, referred to by Mr. H. Donisthorpe in our *Proceedings*, (9 : 82), is a very interesting addition to the records of the behaviour of these beetles. Miss Kirk's ladybirds hibernated in a crevice in the ornamental plaster of the ceiling but in warmer weather left their retreat and flew about the room for hours at a time, striking the ceiling and always settling down in their old quarters. Miss Kirk has kindly informed me that all, or occasionally some, of the Coccinellids left the crevice in the evening, never in the daytime, and were back again in the morning. The fact that the deserted crevice should have been promptly regained suggests some definite stimulus—probably smell, because a small, roundish, discoloured patch marked the exact spot on which they clustered. This same resting-place was used in the following year but by very few of the beetles.

J. H. Fabre's account † of the seven-spotted ladybird assembling on Mont Ventoux suggests hibernation, but the gathering which he observed in June on the tableland of St. Armand can hardly have been for this purpose. He describes the effect of the sun's rays upon the legions of ladybirds gathered on the pedestal of a stone cross and the rocks forming its base. "They were mostly quite still, but wherever the sunbeams struck there was a continuous exchange of place between the newcomers, who wanted to find room, and those resting, who took wing only to return after a short flight." This summer assemblage which puzzled Fabre may probably be explained as an adaptation to promote cross-breeding, as suggested in our 1904 *Proceedings* (1904 : xxii-xxvi) where many examples of Coccinellid and other gatherings are discussed.

My friend Dr. C. B. Williams has sent me the following interesting observations on the assembling of *D. plexippus*, the Monarch butterfly, described by Mr. L. McCormick-Goodhart, of Langley Park, Silver Spring, Maryland, in a letter to Capt. T. Dannreuther, R.N. :—

"1934, Oct. 19.—These butterflies were in enormous quantities on Nantucket Island where my family and I spent the summer and where the prevailing summer wind is a fairly strong westerly one. In the evenings we were fascinated by the way in which they roosted on the trees by the house. The butterflies would come in from every point of the compass and promptly join their comrades on a particular section of the foliage on the side of the tree away from the wind. The flight towards the trees took about half an hour in all." A little later in the letter the writer states that "about a hundred of these active Monarchs roost every night like starlings on the three forty-foot silver Maples by the house."

\* 1924, *Ent. Record*, **36** : 9-10.

† "Insect Life," Engl. transl., Macmillan, Lond., 1901, pp. 202-204.



In these fascinating assemblages various possible interpretations are to be borne in mind :—

1. *Migration*, ensuring that the bands are not scattered and dissipated; also that both sexes are represented.
2. *Hibernation*, ensuring these same conditions during and at the end of the winter sleep.
3. *Promotion of cross-breeding*, due to the assemblage at one spot of insects scattered over a wide area.
4. *Enhancement of aposematic effect*, a result suggested, as regards protective odours, by Fritz Müller, in *Kosmos*, Dec. 1877, translated by Prof. R. Meldola in our 1878 *Proceedings*, 1878 : vi, vii.

It is obvious that two or more of these advantages of the gregarious habit are generally combined. Indeed the last-named would appear to be nearly always present.

### Warning Colours and Mimicry : a Reply to Dr. McAtee.

By HUGH B. COTT, M.A., F.R.P.S., F.Z.S.

(From the Department of Zoology, Glasgow University.)

WITH PLATES I-IV.

[Communicated, in the absence of the author, by Prof. POULTON, who referred to the unfairness of Dr. McAtee's criticisms, and, after reading Belt's account of the Nicaraguan frog from the rare original edition (1874), presented to the Society by the late Mrs. Meldola, recalled Darwin's opinion of the work—"It appears to me the best of all natural history journals which have ever been published."]

In the *Quarterly Review of Biology* for June, 1933 (9), there appears from the pen of Dr. McAtee a somewhat aggressive notice of my paper "On the Ecology of Tree-Frogs in the Lower Zambesi Valley, with special reference to Predatory Habits considered in relation to the Theory of Warning Colours and Mimicry" (4). Besides much that is either frivolous or irrelevant, the review is compounded so largely of misstatement and misrepresentation, that I feel bound to reply to this attack by drawing attention to some of the fallacies and extravagant assertions which it contains.

The greater part of the review consists of a criticism of one of the introductory sections in my paper, in which I discussed the appearance, habits and habitat of some East African tree-frogs and made certain tentative suggestions relating to the adaptive significance of colour in the Anura. I hope Dr. McAtee will forgive me for saying that if he had observed these tree-frogs, as I have done, in their natural surroundings in the palm forests of the Lower Zambesi, the greater part of what he says under this head would not have needed to be written.

Dr. McAtee writes at considerable length upon *Megalixalus fornasinii*, a small tree-frog wearing a bold disruptive pattern which I suggested—on the evidence of the frog's appearance in the field and of its food-habits as shown by stomach-contents—operates as an aggressive colour-scheme, enabling it to ambush active prey (ACRIDIIDAE, Odonata, MUSCIDAE and Lepidoptera), which groups were eaten in conspicuously greater numbers by *M. fornasinii* than by any other species examined

(p. 476, Table II). We will now consider, as briefly as possible, what Dr. McAtee's criticism in this connection is worth.

On the general question of the appearance of *M. fornasinii*, his argument is irrelevant. "What matter," he asks, "to its victims whether it is frog-like or unfrog-like? It is one of the things that gets them and if they react defensively at all, it would be in relation to what the frog is—an enemy—without regard to kind." Dr. McAtee is apparently either unable or unwilling to appreciate the function of a disruptive colour scheme, which may—as every field naturalist knows—be most effective in rendering more difficult the recognition of an animal by enemies or by prey. It is easy for Dr. McAtee to deny the effectiveness of this type of camouflage; but the experience of the Great War proved that it was neither easy nor expedient to dispense with precisely this principle, which was applied in the so-called "dazzle" painting of ships with conspicuous success as a means of defence against submarine attack.

Passing from general to particular aspects of the question Dr. McAtee proceeds to criticise my observations on the stomach-contents of this frog. Referring to the ACRIDIIDAE he tells us: "The statement that they are eaten in conspicuously greater numbers by this frog than by any of the other species examined is untrue, as 7 ACRIDIIDAE were found in 360 stomachs of *Megalixalus*, or 1 to each 51·4 stomachs, while 3 were found in 122 stomachs of another frog (*Hyperolius argus*), or 1 to each 40·6 stomachs." It is often useful to read a document before stating what is contained in it. If Dr. McAtee will turn to the page concerned (p. 486) he will see that he has misstated the facts, and that 4 ACRIDIIDAE were found in 254 stomachs of *H. argus*, or 1 to each 63·5 stomachs; and, incidentally, that the only other species (*H. bayoni*) to contain *any* of these insects had a single example in 110 stomachs—a point which he conveniently omits to mention.

Dr. McAtee continues: "The Lepidoptera found in the stomachs of this frog were more than half larvae or caterpillars, mere 'worms' to which the terms 'active, alert, rapid in flight' most assuredly do not apply." This remark misrepresents the facts. The figures to which Dr. McAtee refers and to which I referred (Table II)—namely 26 Lepidoptera from 360 *M. fornasinii* as compared with 11 from 438 other tree-frogs—do not, of course, include larvae. They relate to adult insects only. But had Dr. McAtee been in any doubt upon this point, he could have verified the matter by turning to Table IV where the food-animals are classified, and where separate figures are given for caterpillars and adult insects.

We then read the following criticism: "Cott, while dilating on the powers of *Megalixalus* in capturing prey 'active, alert, rapid in flight,' says nothing about the much greater prevalence in the food of this frog of the feeble and partly wingless plant lice." Now this statement is, so far as I can see, quite irrelevant. It also happens to be quite untrue. I never said, or implied by what I said, that *Megalixalus* eats no food other than that which was active, etc. But I did point out (p. 503) in reference to plant lice eaten by this species that "they appear to be rarely used as food, for only eight out of 245 frogs [with recognisable stomach-contents] had eaten them, the stomachs of two frogs containing more than half the total number."

With reference to the next curious remark, which follows immediately after the above, that I have nothing to say as to why this frog fed to a considerably smaller

extent upon ants than did any of the other species—is it possible that Dr. McAtee has failed to realise that if the frog's food is made up of a larger percentage of large insects, *e.g.* ACRIDIDAE, MUSCIDAE, etc., than that of the other frogs examined, it must eat a lower percentage of smaller insects, *e.g.* ants, which make up the main food (93–98 per cent.) of the other frogs?

Dr. McAtee next turns his attention to the question of warning colours, and we have further examples of the misleading statements, error, and prejudice with which he expresses his unfathomable antagonism to everything not in accord with his own views. In reference to *Hyperolius argus*, the females of which have a striking and distinctive colour pattern—being purplish or chocolate-brown, with large conspicuous orange black-bordered ocelli on the back and a canthal stripe of the same colour—I made the tentative suggestion that this colour-scheme may have an aposematic function. What I said was: “Were there any evidence (and at present I know of none) to show that the females are ‘protected’ by a poisonous secretion, then this would be cited as a good example of warning coloration. The conspicuous colour-scheme and the habit of exhibiting this to the best advantage in exposed situations certainly suggests something of the kind” (p. 478). My reviewer takes exception to this suggestion, and in doing so he attempts to improve on it with a somewhat comical suggestion of his own. He has evidently never seen the frogs upon whose appearance he speculates, for he speaks of the “eye-spots” as “almost matching some of the holes on a leaf on which it sits.” If holes in leaves are circular, coloured bright orange and edged with a black margin, then I would agree with him, but holes of this description are outside my own experience.

The adaptive significance of colour, about which a good deal is known in relation to insects, has been little studied in relation to the Anura. The question is one which for reasons of space could not be considered in the paper under review, beyond reference in a general way (p. 478) to certain classes of coloration, namely procryptic coloration, special protective resemblance, flash colours, and warning colours associated with poisonous secretions, and to the habits of birds and snakes, the chief enemies of the group. In conclusion I said: “Faced as we are at present with scanty data, it is impossible to reach definite conclusions. The facts at our disposal do, however, appear to indicate clearly that we have in these batrachians phenomena which closely parallel many of those relating to procryptic and aposematic colouring in insects. It would be a study of the greatest interest to determine, by observation in the field and by experiment, to what extent the various features of adaptive coloration in the latter group find their analogy here.” In order to show the close resemblance between the adaptive coloration of batrachians and insects, photographs of the former, taken during life and in entirely natural surroundings, are reproduced on plates I–IV. Procryptic resemblances to grasses and tangled vegetation (I), to leaves (II), to bark (III, fig. 1; IV, fig. 1), recall the protective colours and patterns of insects living in similar environments, while the aposematic display (III, fig. 2; IV, fig. 2) is brought about by the same bright colours and sharp contrasts with which we are familiar in insects. It will also be observed that the photographs were taken in different parts of the world.

I wish to emphasise that it is essentially only when different animals—whether frogs or insects or others—are studied in their natural surroundings that it is



possible to appreciate the significance of form, colour and pattern, and then only in the *living* creature, when these can be considered in relation to particular postures and habits, and to the habits of potential prey and enemies. As regards frogs, observations in this field are greatly needed. It must be remembered that birds and snakes, the chief enemies of frogs, hunt largely by sight. The following vivid account by Ditmars (5), which I quote in full, illustrates the important place occupied by vision in the hunting of prey by *Eutenia saurita*:—"The writer witnessed an example feeding in a belt of swampy timber. The high rasping croak of a small frog, directed his attention to the ribbon snake, about two and one-half feet long, which had grasped the frog by a hind leg. So vigorous were the frog's efforts, that it tore itself from the snake's grasp and started away in a series of rapid hops, with the reptile in pursuit. The serpent's movements were amazingly quick, and its power of vision in following the movements of the frog apparently acute. It darted after the amphibian for a distance of possibly eight feet, when the frog stopped, having secreted itself among some leaves. The snake also paused, but was all attention, with neck upraised and constantly darting tongue. It prowled about in frenzied fashion, when a movement of the frog attracted its attention, and it was instantly upon it, this time retaining its hold until the prey was swallowed." This incident is of particular interest because it illustrates the vital importance of *stillness*, without which the best oblitative coloration can be of no avail.

Dr. McAtee, as we should expect, disagrees with the analogy between adaptive coloration in frogs and insects respectively, to which I have drawn attention. He describes my attitude as "a very good one-page record of assumption, misstatement, and error even for a selectionist." The passages to which he refers in these terms are discussed below. But what interests me here is not so much his opinion of my work as his method of attacking it—which is to ignore the evidence, and then to deny that it exists. Thus, referring to the adaptive significance of colour in frogs, his first criticism is that "self-persuasion in the lack of evidence is something entirely out of place in science." Now there is no lack of evidence—even on the page to which he refers; Dr. McAtee might do well to consider whether there is a place in science for self-persuasion in spite of evidence.

His second criticism here is against my remark, "Poisonous skin-secretions are of common occurrence among the Anura. In many species they are known to furnish an effective means of defence against predatory enemies." "If the word *many* is taken at its ordinary valuation, this," he says, "is a definitely untrue statement" (p. 211). As this point is closely related to the next, I shall deal with both together below. Finally, referring to my remark that "Snakes and birds, the principal enemies of frogs, depend largely upon vision in hunting prey. There is evidence that these enemies learn to discriminate between poisonous forms and those which are good to eat," he reverts to his earlier contention that "there is no evidence of any frog being dangerously poisonous either to snake or bird predators upon it, hence the discrimination alleged is a myth." In view of the above dogmatic denials and assertions, it will be appropriate to direct attention to observations which bear directly upon these two questions.

One of the earliest observations on the efficiency of poisonous secretions in the Anura is that by Belt, the naturalist and explorer, who gives the following account of certain Nicaraguan frogs (2):—"In the woods around Santo Domingo there are

many frogs. Some are green or brown, and imitate green or dead leaves, and live amongst foliage. Others are dirty earth-coloured, and hide in holes and under logs. All these come out only at night to feed, and they are all preyed upon by snakes and birds. In contrast with these obscurely coloured species, another little frog hops about in the day-time dressed in a bright livery of red and blue. He cannot be mistaken for any other, and his flaming vest and blue stockings show that he does not court concealment. He is very abundant in the damp woods, and I was convinced he was uneatable so soon as I made his acquaintance and saw the happy sense of security with which he hopped about. I took a few specimens home with me, and tried my fowls and ducks with them; but none would touch them. At last, by throwing down pieces of meat, for which there was a great competition amongst them, I managed to entice a young duck into snatching up one of the little frogs. Instead of swallowing it, however, it instantly threw it out of its mouth, and went about jerking its head as if trying to throw off some unpleasant taste."

Of *Bombinator igneus* Gadow says (7): "When these toads are surprised on land, or roughly touched, they assume a most peculiar attitude. . . . In reality this is an exhibition of warning colours, to show the enemy what a dangerous animal he would have to deal with. The secretion of the skin is very poisonous, and the fire-toads are thereby well protected. I know of no creature which will eat or even harm them. I have kept numbers in a large vivarium, together with various snakes, water-tortoises, and crocodiles, but for years the little fire-bellies remained unmolested, although they shared a pond in which no other frog or newt could live without being eaten. Hungry water-tortoises stalk them under water, touch the intended prey with the nose in order to get the right scent, and then withdraw from the *Bombinator*. . . ."

The same authority tells us that the "strongly poisonous secretion" of *Dendrobates tinctorius* is said to be employed by the Indians of Columbia for poisoning their arrows, the poison acting on the central nervous system and being used especially for shooting monkeys (7).

Ditmars, whose wide experience as a field naturalist and as Curator of Reptiles in the New York Zoological Park enables him to speak with authority, says of the feeding-habits of the Black Snake (*Zamensis*): "Frogs are also eaten, but among these are several species that the snake will grasp and immediately reject. An example of this type of batrachian is *Rana palustris*, which exudes an irritating secretion from the skin. Toads are never eaten. . . ." (5).

The poison of *Rana palustris*, the common Pickerel Frog, is also referred to by Wright, who states that it will frequently kill other species of frogs carried home in the same jar with it (12).

The effectiveness of the poison of toads is mentioned by Gadow, who says: "The milky secretion of toads protects them against many enemies, although not always against the grass-snake. A dog which has once been induced to bite a toad, suffers so severely that it will not easily repeat the experiment" (7).

Referring to the East African toad *Nectophrynoides vivipara*, Loveridge (8) states that "When killed in chloroform the large glands on the back and limbs exude a considerable quantity of poison which is as fluid as cow's milk."

*Bufo marinus*, the giant toad of the Amazon, is rendered formidable and well-immune from predatory attack by the virulent poison of the highly developed

parotid glands. The fatal effect of the poison on would-be predators was brought to my notice all too plainly in the case of a fox terrier belonging to the Rev. A. Miles Moss, of Pará, when it inadvertently bit one of these toads and died within a few hours as a result of the poison discharged into its mouth. Of this species Noble writes that it "produces one of the most virulent poisons known among the Amphibia, one that frequently kills dogs which have not learned to leave the toad alone" (10).

*Hyla venulosa*, the Brazilian "flying" frog, produces, on being handled or irritated, a copious flow of whitish secretion—sticky and acrid, which cannot fail to act as a deterrent to many potential predators.

Of a related species Barbour writes as follows: "*Hyla vasta*, of Santo Domingo, has a skin poison so strong that it burns one's hands painfully when the frog is handled" (1).

Noble says of the African *Phrynomantis bifasciata*, that it also has "been found under certain circumstances temporarily to inflame the hands of the collector" (10), and that both this and the previous species produce great quantities of milky secretion.

In a recent publication Loveridge (8) also refers to the skin secretions of the gaudy and sluggish *P. bifasciata* as follows:—"I have previously drawn attention to the poisonous nature of the secretions of this frog, a further example came to my notice at Mwaya. One of my boys brought me a bag containing a mixed catch of frogs from bananas—*Hyperolius*, *Megalixalus*, *Leptopelis* and half-a-dozen *Phrynomerus* [*Phrynomantis*]. I chloroformed the whole lot in the bag. An hour later I tipped the catch out on to a table and began picking out the various species. The *Phrynomerus* had exuded a considerable amount of intensely sticky dermal secretion which had gummed the smaller *Megalixalus* together. After separating these and dropping them into water I could not get the gummy mucus off my fingers by washing and so rubbed them in the dust—as a monkey would do—then by rubbing them together shed the mucus like so much gutta-percha. Shortly afterwards irritation set in on my finger-tips, entirely comparable to the irritation produced by stinging nettles and it actually appeared to spread *within* my arm up to the elbow of the right arm. . . ."

It may be noted here that where very conspicuous colours occur in the group, they are characteristically associated with an effective means of defence, though the converse is by no means true, for other forms, such as *Hyla*, *Bufo*, *Ceratophrys*, may combine poison with cryptic coloration and habits. On the question of warning colours Gadow writes (7): "Most, if not all, Amphibia are more or less poisonous, and it is significant that many of the most poisonous, e.g. *Salamandra maculosa*, *Bombinator*, *Dendrobates*, exhibit that very conspicuous combination of yellow or orange upon a dark ground, which is so widespread a sign of poison." Further striking examples of this relationship between aposematic colour and effective poison in frogs are furnished by the red and blue frog described by Belt, by the observations (quoted below) of Budgett and Professor Graham Kerr in the case of *Phryniscus* and *Phyllomedusa*, and by the pink or vermilion, and black *Phrynomantis bifasciata*.

The foregoing observations prove the effectiveness of skin-secretions in defending certain Anura against predatory attack. I shall now recall some further observa-



tions, which besides providing additional evidence upon this point, are especially significant in relation to discrimination by predators.

The following valuable observations by Ditmars (5) throw light upon this question, and I quote in full his account of an experiment in New York Zoological Park to test the powers of discrimination in the King Cobra (*Naia bungarus*). "To test the assertion that *N. bungarus* feeds but seldom upon the Viperine snakes, possibly possessing an instinctive dread of the deep wounds liable to be inflicted by the fangs of such reptiles, the following experiment was conducted.

"A large, thick-bodied, harmless water snake (*Tropidonotus taxispilotus*), and a poisonous water moccasin (*Ancistrodon piscivorus*), of much the same proportions, were selected for the experiment during a period when the big cobra was voraciously awaiting its weekly meal of a living snake. The door of the cage was rolled back, and the poisonous snake thrown inside. The cobra made the customary rush for the food, but upon reaching the snake paused abruptly.

"This was the first time in the feeding of this king cobra in our Reptile House that he failed immediately to seize his victim and begin to swallow it. The moccasin was permitted to remain in the cage for about five minutes, during which time the cobra reared slightly from the door, and regarded it intently. To ascertain whether the cobra was hungry, a common striped snake was placed in the cage. It was grasped and swallowed without hesitation.

"The moccasin was again introduced. There was the same rush, and the same careful examination of the newcomer. This time, annoyed by the unceremonious treatment it had received, the pit-viper showed fight. Upon this display of hostility the cobra backed off hurriedly, nervously dilating its hood, and rearing upward. The moccasin was finally removed unharmed, and the large, harmless water snake was quietly placed in the cage. To the human observer it matched the moccasin closely, and made a show of temper considerably more emphatic than the former, but the cobra attacked it without an instant's hesitation and soon swallowed it. This experiment was repeated, and always with the same result. The cobra appeared to instantly distinguish the dangerous character of the poisonous snake."

Discrimination, in spite of Dr. McAtee's assertion, is no myth. That preference in the choice of food is usual with the majority of snakes is evident from Ditmars' account of the feeding-habits of *Spilotes* (5): "The species of *Spilotes* are particularly interesting in their feeding habits, as they are quite omni-carnivorous—feeding upon lizards and snakes, all types of batrachians, including the toads, *which lack of preference in the selection of prey among creatures that greatly vary in a possession of highly irritating skin secretions, is quite unusual for serpents that also prey as often as occasion permits, upon mammals and birds* " [italics mine].

The boomslang (*Dispholidus typus*) hunts for frogs in addition to its more favourite food of chamaeleons, birds, and their eggs; but it will not eat toads (6).

Budgett (3) mentions the food preferences of a grass snake, which was able to discriminate between palatable and unpalatable batrachians. A frog, *Paludicola signifera*, was put into a cage "in which were many brightly coloured frogs, including *Phrynisus nigricans* and *Phyllomedusa hypochondrialis*. In this cage was also a small grass snake. Hitherto it had taken no interest at all in the gaudy frogs in its cage; but as soon as the little *Paludicola* made its first spring, it was caught in mid air by the snake." It may be added here that the colour of *Phrynisus*

*nigricans* and *Phyllomedusa hypochondrialis* is in each case typically aposematic, that of the former species being black with yellow spots above, and black and scarlet beneath, while in the latter the back is green or blue, and the flanks scarlet with transverse bars of black.

Some of the earlier quoted observations relating to poisonous secretions as a means of defence may also be recalled here as further evidence of discrimination by snakes and other reptiles, e.g. Gadow on the immunity of the fire-bellied toad, and Ditmars on the food-habits of *Zamensis*, and by birds, e.g. Belt's aposematic frogs refused by fowls and ducks.

In conclusion, I may mention another clear case of discrimination for the particulars of which I am indebted to Professor Graham Kerr. This relates to a Seriema (*Cariama cristata*) which was kept as a pet in the Paraguayan Chaco. The bird, though tame, had complete liberty, and being very fond of frogs, it was accustomed to follow its owner, anticipating the amphibian tit-bits which were to be discovered beneath the logs and stones that were overturned for the bird's inspection. But the Seriema was under no misapprehension as to the unpalatability of the black and yellow and scarlet *Phryniscus nigricans*. One look was enough: it could never be induced to have anything to do with this species, which, says Budgett, "at ordinary times is the slowest and most bold of frogs." Charles Darwin also writes\* of this species which he observed when visiting Bahia Blanca in 1833:—"Amongst the Batrachian reptiles, I found only one little toad (*Phryniscus nigricans*), which was most singular from its colour. If we imagine, first, that it had been steeped in the blackest ink, and then, when dry, allowed to crawl over a board, freshly painted with the brightest vermilion, so as to colour the soles of its feet and parts of its stomach, a good idea of its appearance will be gained. If it had been an unnamed species, surely it ought to have been called *Diabolicus*, for it is a fit toad to preach in the ear of Eve. Instead of being nocturnal in its habits, as other toads are, and living in damp obscure recesses, it crawls during the heat of the day about the dry sand-hillocks and arid plains. . . ."

The above observations by the herpetologists and field naturalists best qualified to speak on these matters provide a valuable and illuminating contrast to Dr. McAtee's *ex cathedra* pronouncements upon the general inefficiency of the defensive secretions of the Anura, his special pleading that there is lack of evidence for the adaptive significance of colour in frogs, and his confident assertion that discrimination by birds and snakes is a myth!

Dr. McAtee next turns his attention to the adaptations of insects. Commenting upon Swynnerton's experiments (11) which I quoted (pp. 493-4), he once more restates his views on the indiscriminacy of predators, endeavouring to explain away the reluctance of insectivorous animals to eat protected insects as due, not to preference, but to satiety. He says: "A man can eat beefsteak until it palls upon him, but still have an appetite for pastry, and perhaps even for icecream and candy after that. The reverse, however, is just as true, for, granted a fresh start, after being cloyed with candy, he can again relish beefsteak." Now this is all very entertaining, but what does it prove? Does Dr. McAtee believe that a choice of food that is due to satiety disproves the existence of a choice of food that is due to preference? But apart from the bad logic of his argument, the analogy is false,

\* *A Naturalist's Voyage*, 1897. London. Chap. V, p. 91.

in that the comestibles which he mentions are all more or less palatable, whereas the insects under consideration are believed by everyone except Dr. McAtee to be relatively unpalatable.

"The whole of the experimental evidence as to edibility of prey," Dr. McAtee tells us, "is scarcely worth the paper it is printed upon, a fact pointed out by McAtee twenty years ago." This is not a fact, but an expression of opinion; and twenty years ago the greater part of the experimental evidence as to edibility was not on paper: nevertheless his statement is not without value, for it enables those who are familiar with the experimental evidence to judge how far they may allow weight to Dr. McAtee's opinion. But I am not quite clear what bearing these pronouncements have upon my paper under review, unless they are intended to distract the readers' attention from the fact that my observations were based not upon experiments, but upon the evidence of stomach-contents of wild animals—a type of evidence which is not open to any of the objections which he raises here. Limitations of space prevent me from referring to more than a few of the remaining fallacies on the same page, where Dr. McAtee's well-known conclusions on availability are given a flourish:—"Animals take what is most available at the particular time and place . . . feeding proceeds from the more to the less available items, not from imaginary preferred or palatable, to the less preferred or unpalatable things. No one who has studied the food habits of wild animals can doubt that availability is in general the controlling factor in the choice of food. . . . There is practically no such distinction as insects good, and not good to eat, for the evidence indicates that all are eaten more or less in proportion to their numbers."

Now what is the evidence? It is typical of Dr. McAtee's methods of criticism that in the course of an extensive review of my paper he makes no mention whatever of the main body of evidence which it contains! In the principal section I dealt with the usefulness of various adaptations in protecting insects against predatory attack by batrachian enemies, as indicated by the stomach contents of 794 tree-frogs. This material was classified in order to show what light the feeding habits of these animals throw upon the relation which is supposed to exist between colour and edibility in insects. Of 10,968 specimens sufficiently complete for analysis, only 14 specimens (·13 per cent.) belonged to the typically aposematic colour group. Not only does he completely ignore these and other facts in my paper which strongly support the theory of warning colours, but Dr. McAtee improves upon the occasion by referring to the evidence here as indicating "practical indiscriminacy."

If Dr. McAtee chooses to turn his back upon all the facts which support the theory of warning coloration, that is his own affair. But his methods of dealing with the evidence demand some comment from those whom he would criticise. Here, as we have seen, his methods are to ignore the facts, to misstate the facts, and to misrepresent the views of those who interpret the facts. As though this were not enough, he further confuses the issue with the introduction of irrelevant matter, with abuse of those with whom he disagrees, and with extravagant speculations upon what their religious views might have been had they lived before the days of Darwin!

The little personal thrusts in his present attack can interest no one except myself. For the rest, the dust of error and misunderstanding which he has stirred up will settle; and with the return of better visibility I cannot do better than commend



Dr. McAtee's review, as to fairness, logic and taste, to the judgment of those whom it may interest.

## REFERENCES.

1. BARBOUR, T. 1926, Reptiles and Amphibians. New York, p. 92.
2. BELT, T. 1888, The Naturalist in Nicaragua. London, p. 383.
3. BUDGETT, J. S. 1899, Notes on the Batrachians of the Paraguayan Chaco, with Observations upon their Breeding Habits and Development, especially with regard to *Phyllomedusa hypochondrialis* Cope. *Quart. J. micr. Sci.*, **42** : 329.
4. COTT, H. B. 1932, On the Ecology of Tree-Frogs in the Lower Zambesi Valley, with special reference to Predatory Habits considered in relation to the Theory of Warning Colours and Mimicry. *Proc. zool. Soc. Lond.*, **1932** : 471-541.
5. DITMARS, R. L. 1912, The Feeding Habits of Serpents. *Zoologica*, N.Y., **1** : 219, 227.
6. FITZSIMONS, F. W. 1919, The snakes of South Africa. Cape Town. 152.
7. GADOW, H. 1909, Amphibia and Reptiles. *Cambridge Nat. Hist.*, **8** : 38, 156.
8. LOVERIDGE, A. 1933, Reports . . . of an expedition to the South-Western highlands of Tanganyika Territory. 7 Herpetology. *Bull. Mus. comp. Zool. Harvard*, **74** : 358, 416.
9. MCATEE, W. L. 1933, Warning Colours and Mimicry. *Quart. Rev. Biol.*, **1933** : 209-213.
10. NOBLE, G. K. 1931, Biology of the Amphibia. New York, pp. 134, 135.
11. SWYNNERTON, C. F. M. 1919, Experiments and Observations bearing on the Explanation of Form and Colouring, 1908-1913. *J. Linn. Soc. (Zool.)*, **33** : 203-385.
12. WRIGHT, A. H. 1914, North American Anura; life histories of the Anura of Ithaca, New York. *Carnegie Inst. Wash. Pub.*, **197**.

## EXPLANATION OF THE PLATES.

## Plate I.

*Rana temporaria* Linn. Photograph of the common frog in its natural surroundings, illustrating the combined effect of concealing coloration, obliterative shading and a disruptive pattern, in rendering the animal inconspicuous. From life. Battle, Sussex. Approximately  $\frac{1}{2}$  life size.

## Plate II.

*Bufo typhonius* Linn. A leaf-like South American toad which approaches in its form, colour and marking the special protective resemblance to leaves seen in various butterflies, moths, grasshoppers and leaf-insects. From life. Pará, Amazon. Approximately  $\frac{2}{3}$  life size.

## Plate III.

## Fig. i.

A South American tree-frog, showing the procryptic resemblance to bark. From life. Pará, Amazon. The specimen—the only one of its kind that was seen—escaped while being photographed.

## Fig. ii.

*Hyperolius marmoratus* Rapp. A very conspicuous East African Polypedatid tree-frog, wearing a pyjama-like pattern of light-yellow orange-centred stripes alternating with bands of black. From life. Charre, Portuguese East Africa. Approximately  $1\frac{1}{2}$  life size.



*Rana temporaria* Linn. Battle, Sussex.

Hugh B. Cott, Photo.







*Bufo typhonius* Linn. Pará.

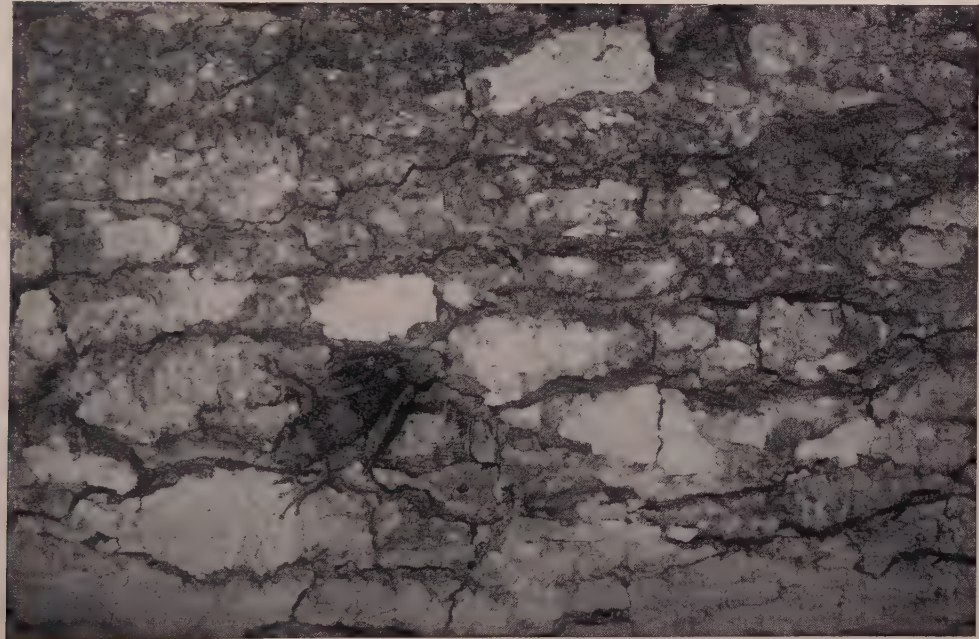
Hugh B. Colt, Photo.





Hugh B. Cott, Photo.

***Hyperolius marmoratus* Rapp. Portuguese East Africa.**



Hugh B. Cott, Photo.

**Unidentified Tree Frog. Lower Amazon.**







Hugh B. Cott, Photo.

*Chiromantis xerampelina* Peters. Lower Zambesi.



Hugh B. Cott, Photo.

*Phrynomantis bifasciata* Smith. Lower Zambesi.





## Plate IV.

## Fig. i.

*Chiromantis xerampelina* Peters. An East African Polypedatid tree frog, showing procryptic resemblance to bark. From life. Charre, Portuguese East Africa. Approximately  $\frac{2}{3}$  life size.

## Fig. ii.

*Phrynomantis bifasciata* Smith. A sluggish aposematic East African Brevicipitid frog, wearing a livery of vermilion and black. From life. Caia, Lower Zambesi. Approximately life size.

**Termination of the Controversy with Dr. W. L. McAtee.** By Prof. E. B. POULTON.

In a recent paper to which the Registrar directed my attention—"Does 'Protective Coloration' protect—results of some experiments with fishes and birds,"\* the author, F. B. Sumner, writes of "the interminable controversy regarding the protective value of animal coloration" (p. 559). Indeed, I fear that to many of our Fellows the discussion must appear well-nigh interminable and that they will welcome its conclusion as heartily as I do. Nevertheless I do not plead guilty to starting it or to entering into it hurriedly. Nearly twenty years passed before I wrote, referring to Dr. W. L. McAtee's first attack,† "I was probably mistaken in not at once writing a detailed reply to these criticisms, which were not only directed against the conclusions drawn from experimental feeding, but also against other conclusions on which the theory of mimicry is founded."‡ The necessary limits imposed upon an address prevented more than a brief statement on that occasion, but in the following year McAtee renewed his attack, in a paper entitled "Effectiveness in Nature of the So-called Protective Adaptations in the Animal Kingdom, chiefly as illustrated by the Food Habits of Nearctic Birds."§ To this and his earlier publication, I replied in a paper, read July 1932—"Attempts to disprove the Theories of Warning Colours, Mimicry and Protective Resemblance in Insects."|| Dr. F. Morton Jones' important paper, "Insect Coloration and the Relative Acceptability of Insects to Birds,"¶ recording his valuable and careful experiments, was read on 1 June and published in December, 1932, the month during which a discussion on "Protective Adaptations of Animals—especially Insects" was held before our Society (1932 (1933), *Proc. ent. Soc. Lond.*, 7: 79-105). To this discussion and Dr. Morton Jones' paper, a rejoinder was published by Dr. McAtee in 1933, *Proc. R. ent. Soc. Lond.*, 8: 113-126, and answered in 1934, *Ibid.*, 9: 21-40. To these published papers, replies and rejoinders must be added Dr. McAtee's

\* 1934, *Proc. nat. Acad. Sci.*, (10) 20: 559-564. To give an adequate account of this excellent paper would occupy too much space and I must content myself with the author's conclusion from his experiments:—"It seems evident, in view of all these facts, that fishes which harmonize in shade with their immediate surroundings are less likely to be eaten by birds (or at least by certain birds) than fishes of the same species which do not so harmonize." (Author's italics, p. 564.)

† *Proc. Acad. nat. Sci. Philadelphia*, 1912: 281-364.

‡ "A Hundred Years of Evolution," the Presidential Address to Section D—Zoology, at the Centenary Meeting of the British Association, London, 1931 (*Rep. Brit. Assoc.*, 1931: 90).

§ 1932, *Smithson. Misc. Coll.*, 85 (No. 7): 1-201.

|| 1932 (1933), *Proc. V. Congr. internat. Ent.*, Paris: 33-44.

¶ 1932, *Trans. ent. Soc. Lond.*, 80: 345. The evidence here brought forward is further strengthened by Dr. F. M. Jones' paper, "Further experiments on coloration and relative acceptability of insects to birds," 1934, *Trans. R. ent. Soc. Lond.*, 82: 443-453, 2 pls.

criticisms answered by Mr. Cott on pp. 109–119, together with the correspondence in *Nature* during 1932.

I have not taken part in this discussion with the slightest hope of convincing Dr. McAtee but in order to guard the reader against accepting his confident assertions and from being misled by his controversial methods. This, I believe, has been sufficiently accomplished and I do not propose to continue the discussion with him, a decision which has been confirmed by the opinion of my friend Dr. F. Morton Jones, who wrote on 29 Sept. 1934 :—

“ I think you are right that continued controversy which leaves the participants still of the same opinion and which takes up so much time and space, is unprofitable. Certainly the accumulation of evidence from every possible viewpoint, will have more permanent value. Obviously, we have not passed that stage yet, in the study of the significance of insect habit, structure, and coloration.”

Apart from the discussion here referred to, Dr. McAtee's disparaging references to “ Selectionists ” suggest that he belongs to the Neo-Lamarckian school, powerfully represented in America half a century ago. I recall many keen but pleasant encounters with American comrades, and especially with my dear friend Prof. Fairfield Osborn at the 1888 meeting of the British Association in Bath, when we argued so far into the hours which should have been devoted to sleep that we found ourselves seriously debating how far an absolutely sterile hybrid could transmit qualities to its descendants ! However, the teachings of Weismann did not take long to soak in, and when Mendelian heredity was rediscovered Lamarckism received another tremendous blow. Although this great rediscovery was at first hailed as the end of Darwinian evolution by Natural Selection, further researches, chiefly by American zoologists, led to very different conclusions, as Prof. H. S. Jennings stated in 1917 :—“ Evolution, according to the typical Darwinian scheme, through the occurrence of many small variations and their guidance by natural selection, is perfectly consistent with what experimental and palaeontological studies show us ”; appearing indeed to the author to be “ more consistent with the data than . . . any other theory.” \*

The termination of this controversy does not by any means imply, as Dr. Morton Jones has pointed out above, any cessation in “ the accumulation of evidence from every possible viewpoint . . . in the study of the significance of insect habit, structure, and coloration.” In order to realise the fundamental importance of this evidence we only need to recall H. W. Bates' words on p. 511 of his classical paper † :—“ The process by which a mimetic analogy is brought about in nature is a problem which involves that of all species and all adaptations.”

\* See *Proc. ent. Soc. Lond.*, 1917 : lxxxv, for amplification and references; also *Rep. Brit. Assoc.*, 1931 : 76, 77, reprinted as No. 2 in 1933, *Hope Reports*, 19. See also S. E. [C.] Harland, on “ The Genetic Conception of the Species,” in *C. R. Acad. Sci. U.S.S.R.*, 1933 : 181–186.

† 1862, *Trans. linn. Soc. (Zool.)*, 23 : 495.

## ANNUAL MEETING.

Wednesday, 16th January, 1935.

Dr. S. A. NEAVE, O.B.E., President, in the Chair.

In opening the meeting the President said,

"Our Bye-laws lay down somewhat precise rules respecting the agenda at our Annual Meeting, which normally begins with the reading of the Council's report, but even these rules must, I think, be modified under exceptional circumstances. I feel sure that you will all agree with me that an exceptional, not to say unique, circumstance has arisen when the Honorary Life President of this Society receives a high honour at the hands of His Majesty the King, our Patron. It is indeed a happy chance for me personally to be occupying this chair on this occasion and to have the honour of moving a vote conveying the heartiest congratulations of the Society to Sir Edward Poulton and expressing the hope that he and Lady Poulton will long live to enjoy this recognition of his great services to our science."

This vote of congratulation having been put to the meeting was passed with acclamation.

Sir EDWARD POULTON briefly replied.

Mr. A. W. McKENNY-HUGHES, Secretary, read the names of Fellows nominated as Officers and Council for the ensuing year, and announced that they had been duly elected in accordance with the Bye-Laws.

He then read the following :—

## Report of the Council, 1934.

In the first year of the Society's second century of life, it is with pleasure that the Council is able to report satisfactory progress in its various activities.

As was reported last year, the Council set up a Committee on Generic Nomenclature and agreed, on the Committee's recommendation, to publish in parts a work entitled "The Generic Names of British Insects." On 23rd February Parts 1 and 2 of this work were published; they contain the "Recommendations relating to the publication of the Committee's Reports," and "The generic names of the British Rhopalocera with a check list of the species," by Mr. FRANCIS HEMMING. Copies of these parts have been sent to all Fellows free. In accordance with the recommendations contained in Part 2, the Council have invited the International Commission on Zoological Nomenclature to take into immediate consideration the case for the suspension of the rules in respect of certain well-known generic names shown to be invalid under a strict interpretation of the rules.

In addition the Council have issued a Label List of the British Butterflies, which is one sale at 9d. per copy.

On 13th September a conversazione was given in the Society's rooms to enable Fellows to meet the delegates to the Third International Locust Conference, then being held in London under Government auspices. Exhibits were on view in the



Library and Meeting Room. The Council is indebted to Mr. C. L. COLLENETTE for his assistance in this matter.

Since the last Annual Meeting one Special Life Fellow, the Rev. W. F. JOHNSON, and the following 11 (5) Fellows have died, or their deaths have been ascertained (the numbers in brackets in this and the following paragraphs indicate the corresponding figures for the previous year):—J. B. HICKS, C. B. HOLMAN-HUNT, Major H. C. JEDDERE-FISHER, R. KELLY, S. T. KLEIN, G. C. LEMAN, W. MANSFIELD-ADERS, A. H. MARTINEAU, H. F. NEWEY, G. B. ROUTLEDGE and M. L. THOMPSON.

The following 5 (6) Fellows have resigned:—J. H. BELL, A. DICKSEE, W. GREENWOOD, R. H. T. P. HARRIS and M. C. MCLEOD.

The following 5 (6) have been removed from the List of Fellows in accordance with the Bye-Laws, Chapter XVI, Section 3:—S. MADWAR, F. MOYSEY, P. W. A. SCOTT, Mrs. H. S. WALSH and F. E. WILSON.

During the year 31 Ordinary Fellows have been elected. This more than compensates for the losses during the year, and the total result is again an increase in the number of Fellows. The Society now consists of 12 Honorary Fellows, 6 Special Life Fellows and 683 Ordinary Fellows, a total of 701.

The meetings have again been well attended, the average number of Fellows and Visitors at each being 60, a decrease of 24 on the previous year, which, however, was considerably above the normal owing to the high attendance at the celebration of the Society's Centenary.

The two parts of the *Transactions* for 1934 (Volume LXXXII) were published on 30th June and 29th December respectively. They comprise 20 papers by 19 authors. Of these, 7 deal with Hymenoptera, 5 with Diptera, 3 with Hemiptera, 2 with Trichoptera, 1 with Lepidoptera, 1 with Insect Teratology and 1 with the relation of insects to the food of birds.

The volume consists of 486 pages, and is illustrated by 17 plates, and thus is well up to the average. Financial assistance has again been forthcoming from various sources. The Royal Society authorised a grant of £75 from the Government Publication Fund towards Dr. RICHARDS' paper, Dr. COCKAYNE paid the cost of the three plates illustrating his paper, Sir EDWARD POULTON and Dr. F. MORTON JONES together paid the cost of the two plates illustrating the latter's paper, and the Zoological Laboratory, Cambridge University, paid half the cost of the figures illustrating Dr. W. H. THORPE's paper.

The volume of *Proceedings* will consist of about 140 pages, illustrated by 4 plates, the cost of the plates being defrayed by a grant from the Carnegie Trustees.

The third volume of *Stylops* consists of 282 pages and is illustrated by 5 plates and numerous text-figures. It comprises 60 papers by 45 authors. Of these, 15 deal with Coleoptera, 12 with Diptera, 8 with Hymenoptera, 6 with Lepidoptera, 6 with Hemiptera, 6 with Odonata, 2 with Thysanoptera, 2 with Psocoptera, 1 with Orthoptera, 1 with Trichoptera and 1 with Collembola.

Professor BALFOUR-BROWNE defrayed the entire cost of the plates illustrating his article on the proventriculus in Coleoptera.

Much of the detailed work of the Society's business has been carried out by a Finance and Housing Committee, under the chairmanship of Brigadier W. H.

EVANS, a Publication Committee under that of Mr. N. D. RILEY, and a Library Committee under that of Dr. K. JORDAN, and the thanks of the Council are again due to those Fellows who have served on these Committees.

The Library, both as regards its organisation and the growth of its contents, has continued to make good progress during the year.

Mr. H. WILLOUGHBY ELLIS generously presented three table lamps of a special design for use on the reading tables, and these have proved very satisfactory in use.

Among the additions to the Library may be mentioned: Hübner, *Erste Beiträge zur Sammlung exotischer Schmetterlinge*, 1808, a photostat copy presented by Mr. H. J. TURNER; *Opinions rendered by the International Commission on Zoological Nomenclature*, Nos. 1-29 and 38-51, completing the set in the Library, presented by Mr. JOHN COWLEY, and the following purchases: Pontoppidan, *Den Danske-Atlas*, Bd. 1. 1763, *The MSS. diary and catalogue of the collection of C. Kuper*, in 6 volumes, a copy of Heft 191 of Panzer, *Faunae insectorum Germanicae*, of which only one other copy is known, and Müller, *Entomologisches Taschenbuch*, 1800.

Considerable progress has been made with the arranging and cataloguing of the collection of separates, 8,900 having now been dealt with. The use of the Library by Fellows continues to grow, and there is again a satisfactory increase in the number who have borrowed books, viz. :—390 (382), and in the number of books borrowed, viz. :—1270 (1061). In addition several books not in the Library were obtained on loan for Fellows from the National Central Library, and some books were sent on loan to that organisation in return.

The Honorary Secretary of the Committee for the Protection of British Insects reports that the Joint Sub-Committee visited Wicken Fen on June 23rd to inspect the result of the summer cutting which had been carried out the previous summer. The result had been most satisfactory and recommendations were made to the Committee for the management of Wicken Fen that further areas should be cut. The Society's representatives also attended the Annual Meeting which was held at Cambridge in July, and again visited the Fen.

The clearing of overgrown portions of Wood Walton Fen has been continued by the Society for the Promotion of Nature Reserves and advantage was taken of the dry summer to dig out two of the dykes. This should benefit the aquatic Coleoptera, etc., whose habitats were becoming restricted owing to the choked condition of the dykes.

The British Association for the Advancement of Science now has an arrangement with the Ministry of Health under which they receive intimation of Town and Country Planning schemes, in order that, should they learn of any scheme involving sites for the preservation of which scientific arguments could be advanced, they may have the opportunity of approaching the local authority concerned, and also the Ministry.

The Committee has already been able to take advantage of this valuable arrangement in supporting the suggested preservation of the Great Wood at Belfairs, near Southend, which is the habitat of several rare and local insects.

*Lycæna dispar batavus* suffered badly both at Wood Walton and Wicken Fens from attack by parasites, but fair numbers of the butterflies were observed and it is believed that a good stock of larvae is hibernating in both Fens.

*Maculinea arion*. The Committee again contributed towards the protection of this butterfly in Cornwall. Not quite so many were observed as last season, but this was thought to be due to the drought. It is satisfactory to learn that our Fellow who is undertaking the protection of this butterfly has been able to arrange that protection should be continued. The Committee wish to tender their thanks to him for his assistance.

The special appeal by the Council for funds to further the work of the Committee resulted in just over £50 being contributed. It is hoped that these subscriptions will be continued. The Committee desires to express their thanks to the donors for their support.

The Committee continues to keep in touch with the National Trust and the Society for the Promotion of Nature Reserves.

The Report was adopted on the motion of Dr. E. A. COCKAYNE, seconded by Rev. E. B. ASHBY.

Mr. FRANCIS HEMMING, Treasurer, then read the following :—

### Treasurer's Report.

The management of the Society continues to call for close attention, and in existing conditions great care is required if the Society is to maintain the present scale of its activities and at the same time to pay its way from year to year.

On the income account, the two most important items are those in respect of annual contributions and sales of publications. Of these, the former is, over a long period, the best index of the Society's prosperity; while the latter reflects more quickly the trend of business activity.

The number of Fellows is higher to-day than in any year since the beginning of the present economic depression in 1929. The rate of increase during the past year was, however, less than in 1933, which was, it is true, an exceptional year owing to the celebration of the Society's Centenary. It is essential to the well-being of the Society that at least for some time to come there should be a progressive increase in the number of its Fellows. It is to be hoped, therefore, that the gradual return to general prosperity will witness a further growth in the Fellowship.

For the first time for a number of years, the income from the sale of the Society's *Transactions* and *Proceedings* ceased to decline and, indeed, showed an increase of approximately £50. In the years of acute depression through which we have been passing, it was inevitable that income on this account should fall away. The reversal of this tendency disclosed in the accounts for the past year is therefore very satisfactory. There are many signs that the worst of the depression is now over. There are thus grounds for hoping that in the next few years the income of the Society from the sale of its *Transactions* and *Proceedings* may continue to show an upward tendency.

On the expenditure side of the account, it will be seen that by careful administration the "House Expenses" were no higher in 1934 than in 1933. In this group of items is included the normal grant from the General Fund of £80 to the Repairs to Premises Fund. During the year, the whole of the outside of the Society's house was re-decorated. This, however, involved no charge on the General Fund of the Society, as the accumulated resources of the Repairs to Premises Fund were suf-



ficient to defray the cost involved and to leave a small credit balance in the Fund.

Under the heading "Office Expenses" there will be found an increase of £110 as compared with 1933. This is due in part to the normal increment in the salaries of the staff, in part to changes in the Society's seals and stationery consequent on the grant in 1933 of the title "Royal," and in part to the purchase of additional furniture.

The allocation to the Library in 1934 amounted to £146, an increase of £45 on the amount so allocated in 1933.

The net amount expended in 1934 on the production of the Society's *Transactions* and *Proceedings* exceeded that so spent in 1933 by £65. The gross expenditure on this account exceeded that in 1933 by over £100, as a result of an increase in the amount of donations which the Society received towards the cost of publishing particular papers. The Society's thanks for these donations have been recorded in the Council's Report for the year.

The position as regards *Stylops* is definitely encouraging. On the one hand, the volume for the year 1934 was more copiously illustrated and was as large as any of its predecessors. On the other hand, the cost of printing was no higher than in the previous year, thanks in a large measure to the care devoted to its production by its editor, our present President. Finally, there has been a small but definite increase in the sales of this journal, as well as a considerable increase in the contributions received from authors towards the cost of reproducing the illustrations to their papers.

The Income and Expenditure Account shows a small excess of income over expenditure, which is carried to the balance sheet.

The balance sheet itself calls for little comment.

In accordance with the policy announced in the Council's Report last year, the legacy received from the late Professor Raphael Meldola has been allocated to defray the cost of producing the new publication "The Generic Names of British Insects," the first two parts of which were published last spring. This legacy has, therefore, been transferred from General Reserve to a special fund entitled "The Meldola Bequest Fund," to which it has been agreed that receipts from the sale of this publication should also be credited.

It will be recalled that in 1929 the Council obtained an actuarial report on the liabilities at that time of the Compounding Fund. The assets in excess of liabilities which were then disclosed were transferred to the Housing Fund. At the same time it was agreed that the liabilities of the Fund should be re-valued every five years. In the early part of last year there took place the first of these quinquennial valuations. This disclosed a reduction in the liabilities of the fund from £1185 to £876. This reduction was due in part to the death during the quinquennium of seven Fellows who had compounded their annual contributions, and in part to the reduced liability to the Society on account of the annual contributions of the remaining forty Fellows concerned. The period under review has, moreover, witnessed a great rise in the value of gilt-edged securities, which has further increased the excess of the assets over the liabilities of this Fund. On receipt of the valuation report on the 6th March last, the Council decided to leave in the Fund securities to the value of £900 on that day and to transfer the surplus to General Reserve. The sum so transferred amounted to £805.

A small innovation has been made in the accounts this year by the addition, at the end, of a Receipts and Payments Account in respect to the moneys received and expended by the Society's Committee for the Protection of British Insects. Only a small balance remains in the hands of the Committee, who would welcome donations from those interested in the protection of our rarer species.

It will be seen from the foregoing report that in the year just closed the Society has maintained and in some directions extended the scope of its activities. That it has been able to do so without incurring liabilities in excess of its current resources may in the circumstances be regarded as a satisfactory achievement.

The Report and Accounts were adopted on the motion of Mr. H. M. EDELSTEN, seconded by Sir EDWARD POULTON.

The PRESIDENT then read his Address, and at its conclusion a vote of thanks to him, coupled with the request that it might be printed in the *Proceedings*, was moved by Dr. K. JORDAN, and carried unanimously.

A vote of thanks to the Officers for their services during the year was then passed on the motion of Dr. H. ELTRINGHAM seconded by Sir EDWARD POULTON and carried unanimously. Mr. FRANCIS HEMMING and Mr. A. W. MCKENNY HUGHES briefly replied.





## STATEMENT OF INCOME AND EXPENDITURE for the Year ended December 31st, 1934.

INCOME.		WESTWOOD BEQUEST FUND.		EXPENDITURE.	
1933.	£	1933.	£ s. d.	£ s. d.	
To interest on Birmingham Stock ...	7	...	7 3 8	By income for the year, carried to Balance Sheet	...
	<u>7</u>		<u>7 3 8</u>		<u>7 3 8</u>
HAMILTON DRUCE BEQUEST FUND.					
1933.	£	1933.	£ s. d.	By transfer to Library Fund	...
To interest on New Zealand Stock ...	44	...	43 16 6	...	...
	<u>44</u>		<u>43 16 6</u>		<u>43 16 6</u>
LIBRARY FUND.					
1933.	£	1933.	£ s. d.	£ s. d.	
To transfer from Hamilton Druce Bequest Fund—interest on New Zealand Stock	44	...	43 16 6	By expenditure on new books	...
" transfer from General Fund	101	...	146 3 6	" binding, repairs and insurance	...
" donation by R. W. Lloyd, Esq.	8	...	2 15 0	" Excess of Income over Expenditure carried to Balance Sheet	...
" miscellaneous	153	...	192 15 0		174 10 10
" excess of expenditure over income, carried to Balance Sheet	44	...	£102 15 0		18 4 2
	<u>44</u>		<u>£102 15 0</u>		<u>£192 15 0</u>
	<u>£197</u>		<u>£197</u>		
REPAIRS TO PREMISES FUND.					
1933.	£	1933.	£ s. d.	£ s. d.	
To transfer from General Fund	80	...	80 0 0	By expenditure on repairs	...
" excess of expenditure over income carried to Balance Sheet	—	...	88 7 7	" excess of income over expenditure, carried to Balance Sheet	...
	<u>80</u>		<u>£168 7 7</u>		<u>£168 7 7</u>
	<u>£80</u>		<u>£80</u>		
MEDOLA BEQUEST FUND.					
1933.	£	1933.	£ s. d.	£ s. d.	
To sales	—	...	£ 4 9 9	By expenditure on "Generic Names of British Insects" Parts I and 2	...
" interest on deposit	—	...	2 5 0		68 7 9
" excess of expenditure over income carried to Balance Sheet	—	...	59 13 0		...
	<u>—</u>		<u>£66 7 9</u>		<u>£66 7 9</u>

## BALANCE SHEET, December 31st, 1934.

GENERAL FUND.											
LIABILITIES.					ASSETS.						
	£	s.	d.		£	s.	d.		£	s.	d.
To sundry creditors	...	...	...	By sundry debtors—	...	...	...	subscriptions valued at	85	0	0
" " subscriptions in advance	...	...	...	admission fees	...	...	...	publication sales	22	1	0
" " excess of assets over liabilities :	...	...	...	rent and contributions to house expenses	...	...	...	sundries	181	15	10
at 31st December, 1933	...	...	...	payments in advance	...	...	...		183	8	10
Add excess of income over expenditure for year to date	...	...	...	" unsold copies of publications	...	...	...		5	0	7
				" cash at Bank : deposit account	...	...	...	(Not valued)	477	6	3
				current account	...	...	...		12	12	9
				" cash in hand	...	...	...		—		
					...	...	...		189	12	7
					...	...	...		42	18	2
					...	...	...		232	10	9
	£722	0	9						£722	0	9

## WESTWOOD BEQUEST FUND.

	£	s.	d.	£	s.	d.
To excess of assets over liabilities at 31st December, 1933	264	7	4	257	3	8
Add income from investment for year to date]	7	3	8			
	271	11	0			
Less part cost of plate	14	7	4	257	3	8
				£257	3	8

## HAMILTON DRUCE BEQUEST FUND.

To excess of assets over liabilities at 31st December, 1933	£	s.	d.	
...	1,000	0	0	...
	£1,000	0	0	
	£	s.	d.	
By £1,095 15s. 6d. New Zealand 4% Stock 1943/1963 at cost	1,000	0	0	...
(value at date £1,172 9s. 5d.)				
	£1,000	0	0	

## LIBRARY FUND.

To sundry creditors	£	s.	d.
...	...	...	...
By library furniture and fittings	...	...	...
" library books (valued at £10,000)	...	...	(Not valued)
" cash at Bank	...	...	...
" excess of liabilities over assets at 31st December, 1933	...	...	...
<i>Less excess of income over expenditure for year to date</i>		28	18 9
		18	4 2
		10	14 7
		£23	4 6

## BALANCE SHEET, December 31st, 1934.

## REPAIRS TO PREMISES FUND.

## LIABILITIES.

To sundry creditors ... ..  
 To excess of assets over liabilities at 31st December, 1933 ... ..  
*Less* excess of expenditure over income for year to date ... ..

£ s. d.  
 ... ..  
 114 16 10  
 88 7 7

## ASSETS.

By cash at Bank ... ..

£ s. d.  
 20 12 6  
 ... ..  
 47 1 9

26 9 3  
£47 1 9

## HOUSING FUND.

To excess of assets over liabilities at 31st December, 1933 ...

£ s. d.  
 £13,417 3 4

By freehold premises, 41, Queen's Gate, at cost ... ..  
 " cost of New Meeting Room Scheme ... ..

£ s. d.  
 ... 6,250 0 0  
 ... 7,167 3 4

13,417 3 4  
£13,417 3 4

## COMPOUNDING FUND.

To excess of assets over liabilities at 31st December, 1933 ... ..  
*Add* appreciation in value of investments at 6th March 1934 ... ..

£ s. d.  
 1,185 0 0  
 520 2 5

By £1,094 4s. 5½d. 2½% Consols valued at 6th March, 1934  
 (value at 31st December, 1934, £1,017 12s. 6d.)

£ s. d.  
 900 0 0

*Less* transfer to general reserve ... ..  
 (representing estimated liability of Fund at that date—subject to revision quinquennially.)

1,705 2 5  
 805 2 5

900 0 0  
£900 0 0

## GENERAL RESERVE.

To excess of assets over liabilities as at 31st December, 1933 ... ..  
*Less* transfer to Meldola Bequest Fund—bequest by the late Professor R. Meldola ... ..  
*Add* transfer from Compounding Fund ... ..

£ s. d.  
 450 0 0  
 450 0 0  
 805 2 5

By £259 17s. 9½d. 2½% Consols valued at 6th March, 1934 ... ..  
 " £532 3s. 5½d. 4% Consols valued at 6th March, 1934 ... ..  
 (value at 31st December, 1934, £368 5s. 10d.)

£ s. d.  
 213 14 11  
 591 7 6  
 805 2 5

805 2 5  
£805 2 5

## MELDOLA BEQUEST FUND.

To excess of assets over liabilities ... ..  
 Transfer from General Reserve—Bequest by the late Professor R. Meldola ... ..  
*Less* excess of expenditure over income for year to date

£ s. d.  
 450 0 0  
 59 13 0

By sundry debtors ... ..  
 " cash on deposit at Bank ... ..

£ s. d.  
 ... ..  
 388 18 8

390 7 0  
£390 7 0

(Signed) FRANCIS HEMMING, *Treasurer*.

We have examined the above Balance Sheet and Accounts with the Books and Vouchers of the Society and certify them to be correct. The Solicitors have certified to us that they hold the deeds of 41, Queen's Gate for safe custody on behalf of the Society, and we have verified the Investments and Bank Balances.

23, Queen Victoria Street,  
 London, E.C. 4.  
 9th January, 1935.

(Signed) W. B. KEEN & Co., *Chartered Accountants*.



## COMMITTEE FOR THE PROTECTION OF BRITISH INSECTS.

## RECEIPTS AND PAYMENTS ACCOUNT for the year ended 31st December, 1934.

RECEIPTS.		£	s.	d.	PAYMENTS.		£	s.	d.
To balance 1st January, 1934, in hand	...	...	...	10	To expenditure on preservation of <i>M. arion</i> and <i>L. dispar</i> ...	...	34	15	0
„ donations	...	...	...	52 16 6	„ cheque book...	...	5	0	
					„ balance 31st December, 1934: at Bank	...	15	15	4
					in hand...	...	2	2	0
							17	17	4
							<u>£52 17 4</u>		

(Signed) FRANCIS HEMMING, *Treasurer*.

We have audited the above Account of Receipts and Payments and certify same to be correct.

We have verified the balance at the Bank.

(Signed) W. B. KEEN & Co., *Chartered Accountants*.

23 Queen Victoria Street,  
London, E.C.4.  
9th January, 1935.

## THE PRESIDENT'S ADDRESS.

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LADIES AND GENTLEMEN,

Though the year under review has been uneventful compared with the preceding one, in the course of which we celebrated our Centenary, the reports of the Council and of the Treasurer, which you have just heard read, are evidence of the highly satisfactory progress of our Society, thanks to the unremitting trouble taken by our Honorary Officers and our Registrar. No one is in a better position than myself to appreciate what this amounts to, though I often think that those Fellows of our Society who have not had opportunities of being closely conversant with the conduct of its affairs seldom realise what a large number of hours in the year has to be given to our service by an Honorary Officer if he is to do his duties conscientiously.

Though fifteen years is a very short time in the life of a learned Society, those of you who recall the days when we were at Chandos Street will realise the profound changes that have since taken place, more especially in the scope and magnitude of our various undertakings. The increased importance of our status among learned Societies, however, carries with it further responsibilities. That this has been recognised by our Council is, I think, evidenced by their decision to produce what I venture to predict will be a work of outstanding importance, viz. :—*The Generic Names of British Insects*. Of this, as you know, two parts have already appeared, and others are in preparation. If I make special mention of any of those who have been instrumental in bringing it into being, they must be our Treasurer, Mr. Francis Hemming, who is himself the author of the first list to be published, and Professor W. A. F. Balfour-Browne, who is the Secretary of the Committee in charge of the work.

Another enterprise to which I should like to see some consideration given, when funds permit, is the preparation of an up-to-date catalogue of our now magnificent library. It is already thirty-four years since the last supplement to the existing catalogue was issued, and in the interval that has elapsed we have made enormous additions of many rare books to our collection. A complete catalogue of the library would, I feel sure, be a bibliographical tool of the utmost value to all entomologists.

It now becomes my duty to place on record the losses that the Society has sustained by death during the year. These are somewhat fewer than in recent years, being ten in number.

By the death of the Rev. WILLIAM FREDERICK JOHNSON in his 82nd year, the Society has lost one of its older Fellows. He was elected in 1889 and was created a Special Life Fellow in 1923. He became interested in Entomology early in life and is said to have collected Lepidoptera as long ago as 1863. Later on he also

became greatly interested in other orders, especially the Coleoptera and Hymenoptera, and he contributed many papers on these and other insects chiefly to the *Irish Naturalist* and to the *Entomologist's Monthly Magazine*, to the editors of which I am indebted for many of these particulars.

CYRIL BENONI HOLMAN-HUNT, who was born at Florence in 1866, was the son of the famous painter, W. Holman-Hunt, O.M. He was educated at Harrow and St. John's College, Cambridge. He became a medical student, but did not find this congenial and gave it up in order to go abroad where he might gratify his love of natural history, particularly of Entomology. He spent a number of years as a tea-planter at first in Ceylon and later in South India, but it was not until 1909, when he was appointed Entomologist at the Kuala Lumpur Museum, that he was entirely in his element. During this period he published several papers on insect pests of agriculture. He retired in 1921 and spent his remaining years in Dorset. He had been a Fellow of our Society since 1898 and, though not often present at our meetings, paid occasional visits to the library after his return to England. He died at Bridport in July last, and his will contains a clause bequeathing to us the sum of £100 for "the purchase of or on the production of illustrations for books of interest to the Society." I am greatly indebted to his sister, Mrs. Joseph, for these particulars concerning him.

ALFRED HYDE MARTINEAU, who had been a Fellow since 1897, was in his earlier years an active member of the Birmingham Natural History and Philosophical Society, of which he was President in 1905. He was especially interested in the Aculeate Hymenoptera, his collection of which, according to the *Entomologist's Monthly Magazine* to which I am indebted for these details, is being presented by his widow to the Birmingham Natural History Society.

GEORGE B. ROUTLEDGE, who had been a Fellow since 1890, was born in 1864 and at one time attended our meetings fairly frequently, though he had not done so for many years. He was a great authority on the insects of Cumberland, and he published many papers on them in the *Transactions of the Carlisle Natural History Society*. It is anticipated that his large collections will be deposited in the Carlisle Museum.

MATTHEW LAWSON THOMPSON was born in 1866 and became a Fellow in 1901. He was a prominent member of the Yorkshire Naturalists' Union and was an ardent naturalist. He was seldom able to attend our meetings, but many will remember him as having been present at our Centenary celebrations at which he represented the Yorkshire Naturalists' Union. His special interest was in the Coleoptera, and he took a leading part in the preparation of the list of the beetles published in the Victoria County History of Yorkshire.

Other Fellows whose loss we have to deplore are W. MANSFIELD ADERS, for many years Government Entomologist in Zanzibar, who was elected a Fellow in 1919, J. B. HICKS elected in 1923, Major H. C. JEDDERE-FISHER elected in 1928, R. KELLY elected in 1926, S. T. KLEIN elected in 1887, and G. C. LEMAN elected in 1920.



Of those who have died during the year who were not Fellows of the Society, special mention must be made of one who, though not himself an entomologist, rendered great services to our Society. For the following particulars concerning him I am greatly indebted to my old friend and former teacher Sir Edward Poulton, our Honorary Life President :—

JAMES MARK BALDWIN, the world-famous psychologist, who died on 8th November, was deeply interested in evolution and natural selection. He presented to Oxford University, in the name of the then Hope Professor of Zoology, the "Fund for promoting the study of Social and Organic Evolution" which has provided grants in aid of many important researches. It will be remembered that this Fund, administered by the University Chest under the authorisation of the Hope Professor, has often granted valuable assistance to our publications in recognition of the intimate relation between the study of insects and the problems of evolution. Professor Baldwin and his friends, Professor Lloyd Morgan and Professor Fairfield Osborn, independently originated the important theory for which Professor Baldwin proposed the name "Organic Selection"—the power of individual adaptability enabling a species to survive through a period of changing environment or other stress until relieved by the appearance of some fresh inherent variation.\*

An excellent account of Professor Baldwin's great work in Psychology was published in *Nature* of 1st December, 1934.

Our science has also suffered a grievous loss in the untimely death of that great American Dipterist, JOHN MERTON ALDRICH, at the age of sixty-eight. The loss is all the greater in view of the fact that in recent years he had largely been devoting his attention to the parasitic flies of the family TACHINIDAE, which are of such great economic importance and respecting which our knowledge is still very imperfect.

I will ask you to rise for a moment as a token of respect to the memories of our colleagues who have passed away.

It has probably been said on many occasions similar to the present that no one ever reads a Presidential Address except the author of it. Perhaps it is for this reason that custom ordains that you have to undergo the ordeal of having it read to you at our annual meeting. For many years after our Society was founded, it was customary for the Presidential Address to consist of a summary of the principal entomological events and publications of the year. With the growth of the whole subject and especially of the literature, this became a more and more onerous task, and the custom inevitably languished. Naturally enough the Address then began in most cases to take the form of an account of some subject with which the occupant of the Presidential Chair had some special acquaintance.

It has been my experience to listen to, and on two occasions to read on behalf of absent Presidents, a large number of Presidential Addresses, and I have come

\* This subject was discussed at the Detroit meeting of the American Association for the Advancement of Science in 1897 (*Proc. Amer. Ass. Adv. Sci.*, 46:239-242). See also 1901, *Hope Reports*, 2: No. 14A.

to the conclusion that such addresses should have two main features. They should be short and they should deal with a general subject that is likely to interest in some degree most of those present. Fortunately for myself, the first of these principles closely coincides with my personal inclinations, and such special knowledge as I possess assists me towards carrying out the second.

I therefore propose to-night to ask you to listen to a short account of

*The Development of Bibliographical Work relating to Entomology.*

I have chosen this subject, partly because I have myself been largely associated with work of this character in recent years and partly because I wish to emphasise its fundamental importance, if the science of Entomology, or for that matter any other branch of Natural Science, is to progress. The army of research workers is ever growing and, though the field itself is always widening, individually they tend to study a narrower and narrower one more and more intensively. Without the assistance of elaborate bibliographies and similar publications, they therefore stand a grave risk of being entirely overwhelmed in the flood of literature that now represents the world's output of their results. Even so long ago as the end of the eighteenth and beginning of the nineteenth centuries, relatively scanty though the literature of our subject then was, it was beginning to be recognised that something was required to help the individual student and research worker to find his way about. I do not, however, propose to weary you with a complete history of the bibliographical work that appeared during the last century, more especially as a good account of the principal works of this character was published by one of our Fellows on the other side of the Atlantic a few years ago.\* I will therefore mention only a few of the more interesting and important.

Naturally enough many of these works deal with Zoology as a whole, and Entomology only occupies a relatively small part of them. One of the earliest of this type is Dryander's † Catalogue of the library of Sir Joseph Banks which was published from 1796 to 1800 in five volumes of which Volume 2 is devoted to Zoology and in which the works on insects occupy eighty pages.

The earliest work that I have been able to trace which deals solely with Entomological literature is a very rare little book by Charles Nodier. A copy of this, which formerly belonged to Victor Audouin, is I am glad to say in our own library, though it is unfortunately somewhat imperfect. It is entitled "Bibliographie entomologique ou Catalogue raisonné des Ouvrages relatifs à l'Entomologie et aux Insectes," and is a small 12mo. pamphlet of viii + 64 pages (not 24 as stated by Sherman) of which pp. 13-24 are wanting in our copy, and it was published in Paris in "an IX" of the First Republic, *i.e.* 1801. It is divided into two main sections devoted to descriptive and philosophical Entomology respectively, and it is of interest to observe that the proportion of works devoted at that time to the morphology or classification of insects, compared with that dealing with their relations to mankind, was much smaller than is the case at the present day.

The next work of the kind that deals solely with Entomology, to which I shall

\* Sherman, J. D. 1924. Some entomological and other bibliographies, *J. N. Y. Ent. Soc.*, **32**: 206-215.

† I have to thank our Registrar, Mr. F. J. Griffin, for giving me the opportunity of examining this rare book from his own library.

mainly confine my remarks, was Eiselt's "Geschichte, Systematik und Literatur der Insectenkunde," published at Leipzig in 1836. It occupies 255 pages and professes to include all the literature from Aristotle to that date. The first 120 pages, however, deal mainly with systems of classification. The remaining bibliographical portion is divided under subjects, and it is interesting to note that the section devoted to works on what we should now call Economic Entomology contains 57 titles.

This was followed almost at once by Percheron's "Bibliographie entomologique" in two volumes, published in Paris and London in 1837. This also endeavoured to cover the literature from the earliest times up to 1834. It is arranged under authors, but also comprises a list of anonymous works, a list of the journals containing entomological papers and a table arranged under subjects to the authors contained in the first part.

The next publication of importance is Hagen's famous "Bibliotheca Entomologica," published at Leipzig in 1862. There is no need to describe this invaluable work, which is well known to you all, but the opportunity may be taken of wishing success to one of our Honorary Fellows, Dr. Walther Horn of Berlin, who is undertaking the arduous task of preparing an up-to-date supplement to it.

The year 1864 saw the appearance of the first volume of the world famous *Zoological Record*, respecting which a few details may be of interest. It was at first known as the *Record of Zoological Literature*. The first editor was Dr. Albert Günther, and it was published as a private venture by Van Voorst. As might have been expected in the light of modern experience, this enterprise was not a financial success, and it only survived until 1871, when six volumes had been published. Fortunately the situation was saved by the prompt formation of the Zoological Record Association, in the foundation of which one of our most distinguished past Presidents, H. T. Stainton, was largely instrumental, and to the maintenance of which many other Fellows of our Society were subscribers. With the assistance of this body, the *Record* was carried on for a further sixteen years. By 1887, however, owing to financial difficulties, it found itself unable to continue the publication, and in that year, beginning with Volume 23 (literature for 1886), the responsibility was taken over by the Zoological Society of London, in whose hands it has remained ever since. A full account of the invaluable service that that Society has done in this connection will be found in its Centenary History.\*

The "Insecta" portion of this work occupies approximately half the whole, and its importance to entomologists is incalculable. During its earlier years, its form differed somewhat from that adopted at the present day, such changes as have been made being designed to keep the work within reasonable limits in view of the ever increasing bulk of the literature. The titles, comprising the bibliographical portion, were in the early days often accompanied by brief abstracts or descriptive notices, and more space was found for particulars of known species than is possible at the present day. Moreover, since the Imperial Institute of Entomology undertook the preparation of the "Insecta" part in 1924, it has been found justifiable to omit the papers relating primarily to Economic Entomology, since these are all fully dealt with in the *Review of Applied Entomology*.

\* 1929. P. Chalmers Mitchell. *Centenary History of the Zoological Society of London*, pp. 120-124.



Another work somewhat comparable with the *Zoological Record* is the special volume of the *Archiv für Naturgeschichte* known as the *Bericht über die Leistungen im Gebiete der Naturgeschichte*. This began in the year 1835, but has not been carried beyond the literature for 1915, and there seems to be little prospect of its resuscitation. The work is an inconvenient one to use owing to the absence of any alphabetical list of authors.

It will thus be seen that, by the end of the nineteenth century, considerable endeavours had been made to meet the wants of those interested in Systematic Entomology and in the purely scientific aspects of the subject.

It was not, however, until some years later that the ever-growing flood of literature steadily spreading over a wider and wider field in the biological sciences brought about the need for something more than bibliographies that were primarily lists of titles only. At first attempts were made to meet this demand by the publication by various journals of a limited number of selected abstracts that were in the nature of supplements to their main subject matter.

So far as Entomology was concerned, nothing was yet in existence that met the necessity for bringing together in a compact form the rapidly growing literature on the applied side of the science, relatively small though it then was as compared with the present day, and it was not until 1913 that an attempt was made to meet this need, when the Imperial Bureau (now Institute) of Entomology undertook the publication of the *Review of Applied Entomology*.

This journal, as many of you know, aims at publishing summaries of the whole of the world's literature in two series, one dealing with Agricultural, and the other with Medical and Veterinary, Entomology.

As I have been closely associated with its publication for more than twenty years, I may perhaps be allowed to describe in some detail the methods of producing an abstracting journal of this character and to discuss the fundamental principles involved. It will probably be generally agreed that these should at least include the following :—

(1) An abstracting journal should be as up to date as it is possible to make it ; (2) it should endeavour to cover the whole field of the literature, including all languages ; and (3) it should have a very complete subject index to each volume. Further, in my view, the subject it deals with should be confined within certain definable limits. In these days of an ever-growing tendency to increased specialisation, any attempt to produce an abstracting journal that deals with, say, the whole of biology seems to me to defeat its own object. It is often the case that the scope of a single paper is such that several useful abstracts might be made from it, which might severally be written for the benefit of an Entomologist, Mycologist, Veterinary Officer, etc., but a reasonably short, single abstract of which, directed to biologists in general, would be useless to any one of them.

The work of producing an abstracting journal may roughly be divided into four main branches :—

- (1) The collection of the raw material.
- (2) The making of the abstracts.
- (3) The editing of the abstracts.
- (4) The preparation of the index.

### *The Collection of the Raw Material.*

Experience has shown that it is practically impossible for the staff of an abstracting journal adequately to search the whole of the world's literature on a given subject unless the institution to which they belong either possesses an extensive library of its own or at least has unimpeded access to one. Only by this means can a check be kept on the vast number of journals and reports that must be examined, or the originals that are frequently required for subsequent reference long after the abstract itself has been made and published, be consulted. In the case of the *Review of Applied Entomology*, the number of journals or series of reports that require examination is between eleven and twelve hundred, to say nothing of numerous separates from journals that do not normally publish entomological papers.

### *The Making of the Abstracts.*

The abstracts themselves may be made on several different systems. In the United States an attempt has been made to carry on an ambitious journal, *Biological Abstracts*, largely by inducing authors themselves to provide abstracts of their own papers. This is, in my view, a fundamental error. Apart from the grave disadvantage that it makes prompt publication of the finished abstract impossible, the author himself is by no means necessarily the best medium for producing it. He tends to look at the subject matter from far too limited a point of view, and commonly fails to emphasise the very points that readers need. Furthermore, human nature being what it is, the percentage of authors that can be relied on to provide a regular supply of abstracts must be a very small one.

Another method, but one that is only applicable to certain subjects, is to divide up the work among a number of expert sub-editors, each of whom has to deal with all the literature in a special field. This has been practised with success especially in the medical and veterinary sciences. It necessarily, however, involves considerable delays in the production of the finished article, since it is impossible to maintain a permanent staff of such experts under one roof, and these, if only on account of the language problem, must necessarily be scattered over a wide area.

This method would, however, be quite unworkable for such a subject as Applied Entomology, in view of the huge and ever-increasing field that it covers. The knowledge required by those concerned in its production needs to be on two entirely distinct planes, the technical plane and the language plane, and it would be out of the question to find, say, a sub-editor who, knowing Russian and Serbian, also had some acquaintance with the whole of the order Insecta as well as of all the ramifications into other sciences, such as Chemistry and Physics, into which Applied Entomology carries us at the present day.

Consequently a third method is the one employed in the production of the *Review of Applied Entomology*. In this case the abstractors themselves are not trained entomologists at all, but are selected primarily for their general education and their knowledge of languages. Though in course of time they necessarily acquire a wide general knowledge of the subject, they have not themselves had any technical training in it. Experience has shown that by this means, especially in the case of abstracts made from foreign originals, a more accurate account

of the author's work can be produced, and this can then be checked over for its technical accuracy and put into shape by the editorial staff. Furthermore, it is not desirable that the abstracts should be critical, and this is much less likely to occur where the abstractor's interest in, or knowledge of, the subject is not that of the specialist, whose attitude to the subject matter of a paper is almost unavoidably affected by its agreement or otherwise with his personal views. The function of the abstract should be to give the reader in as compact a form as possible what the author has said, and it should only call attention to errors where they are clearly mis-statements of fact.

One great advantage of this method is that it enables practically the whole staff, both abstracting and editorial, to be employed together under the same roof as that under which their raw material is received and catalogued and the sources of reference required for their work are filed. This is the only method that I am aware of by which an abstracting journal can be maintained really up to date, and it is by this means that the standard adopted by the *Review of Applied Entomology* is maintained, *viz.*:—a part appearing at the end of a given month contains abstracts or titles of practically all the literature that has been received to within seven or eight weeks previously.

### *The Editing of the Abstracts.*

One of the first functions of the editor is the selection of his material, and this tends to become more and more difficult with the expansion of the literature not only in bulk but also in variety of subject. Some twenty years ago this problem was a less troublesome one because it was possible to include practically the whole of the literature. Not only was the matter less varied, but a very high percentage of it was more or less original. At the present day new subjects continually make their appearance. For example, the relation of insects to virus diseases of plants, or of that of the physico-chemical conditions of water to the distribution of mosquitos are two among many that have developed a considerable literature of their own in recent years. Many others have a somewhat indirect connection with Entomology and yet can hardly be reasonably ignored, *e.g.* the removal from apples of arsenical residues that are the result of spraying against insects. The editor must also try to foresee what subjects are likely to expand into important ones even though they may seem of slight significance when first mentioned in the literature. Moreover, now that the *Review* has just completed its twenty-second volume, it is quite natural that it should be made use of by those who write up articles on a given subject. Unless, therefore, care is taken, the editor tends to find himself involved in a sort of vicious circle in which he publishes an abstract of a summary of his own abstracts! Experience shows, too, that there are two distinct ways in which originals may have to be treated. In the case of a monograph or any very large work, it is obviously impossible, for reasons of space, to give details or any actual abstract of the contents, and the most that can be done is to give a descriptive account of them. The shorter paper, on the other hand, can usually have its essence given in some detail. Between these two extremes, however, are innumerable intermediates as to the treatment of which the editor must decide, having regard at the same time for extraneous factors,



such as the accessibility of the journal concerned and the language in which the paper is written.

Another important editorial duty is to endeavour to help the reader by adding to the information given by the original author by means of an elaborate series of cross references to abstracts of other works on the same subject, some of which the author may not himself have been acquainted with.

The problem, too, of the almost infinite number of scientific names involved is a serious one that is much more pronounced in Entomology than in any other branch of biology. A recent estimate of the generic and subgeneric names alone that have been proposed in Zoology indicates that their number approaches 200,000, of which about 60% are insects. It is obvious too that in a work of reference, if only for indexing purposes, it is essential that such names must all be synonymised to conform to the accepted nomenclature. The necessity for doing this does not seem always to be realised, and it may be worth while to give a simple example to illustrate the problems that may arise. In 1934 Dr. N. H. Swellengrebel pointed out the importance of distinguishing between closely allied *Anophelines* such as *Anopheles sundaicus*, which transmits malaria, and *A. ludlowi*, which is believed not to do so. The 1933 volume of the *Review* contains references to the former in seven papers, but only in the last two of these was the species recorded under this name (*sundaicus*) in the original. Consequently the information in the other five would all have been attributed to *A. ludlowi*, if the species had not been checked in the course of editing and indexing.

Troublesome problems of nomenclature also arise in respect of the popular names of insects. These may differ in various parts of the English-speaking world for the same insect, or in some cases the same name may be used for different species in the Old and New Worlds. Somewhat similar difficulties arise regarding the exact identity of diseases with which insects may be associated or of food-plants, when given in a foreign language, and much time is often taken up in ascertaining these, with very little that is apparent to show for it.

All this involves a very great deal of labour, and many hundred names a month have to be checked from the office records, the principal catalogues, etc. Though the best authorities for each order or family are followed, there are many respecting which there is no recognised one, or authorities differ in systems of classifications that are as yet incomplete, and in these cases it is wise to follow a very conservative policy and to avoid changes until they have received some degree of acceptance.

From an administrative point of view the editor also has a difficult task in that he can only predict very roughly the amount of the world's literature. He is therefore very much in the position of the manager of a factory who has no control over either the quantity or quality of raw material he has to deal with. However much there may be of it and however refractory it is, he has to devise means of converting it into the finished article. In practice the monthly output of the combined series of the *Review* amounts to about 250 abstracts and titles, and these have to be published regularly on a specified date. Consequently a very carefully constructed timetable has to be prepared in consultation with the printers and rigidly adhered to by both parties.

*The Preparation of the Index.*

"Index learning turns no student pale,  
Yet holds the eel of science by the tail." \*

It is indisputable that a full subject index is an essential feature of any abstracting periodical and that without it such a publication fails in fulfilling its object. It must be most carefully planned, and its main headings well thought out. In this connection those responsible for its production must not only have a very thorough knowledge of the subject, but must be endowed with some power of foresight, since it not infrequently happens that a point of apparently minor importance, that does not seem to justify being given a separate entry, develops in a few years into one of the major ones. Moreover, owing to the concentrated character of the matter in an abstracting journal, the index itself must be proportionately very much bulkier than is the case with that of a volume containing original papers only.

The problems of synonymy, to which attention has already been drawn, reach their maximum in the index, and in the course of preparing this, advantage is taken to revise the names, some of which have to be altered during the issue of a volume in the light of recent research.

The final assembly of the very large number of entries in an annual volume is an onerous task, and it involves a considerable exercise of the critical faculties. Though it is desirable to retain as much uniformity as possible between one year and another, this can never be entirely obtained in practice owing to the continuously changing character of the data.

Exacting work of this kind is sometimes lightened by unintentional wit on the part of the typist; on one occasion, when an entry should have recorded a pest as having been "intercepted on ornamental plants in Hawaii," the letter "l" in "plants" was omitted!

This, then, is a brief account of one method of producing a somewhat large abstracting journal under modern conditions, and I venture to hope that you have not found the recital of it unduly wearisome.

\* Pope. *Dunciad*, 1:279.

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TO THE

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## ERRATA.

P. 8, lines 9 and 12 from bottom, for "bohemani" read "bohemani."  
 P. 55, line 26, for "brocei" read "brucei."



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